Collection

of articles, abstracts and reports

since 1989

Dr. Mikhail Teppone

Dr. Teppone is currently a Medical Director of *Laboratoire Biogénèse Appliquée*, Asia Pacific (Malaysian Hub).

Professional Education:
- General Medicine Doctor, at the Medical University, St.Petersburg (USSR: 1975-1981)
- Internship at the Medical University in Sverdlovsk city (USSR: Russia, 1981-1982);
- Neurology, Russian State Medical University (Russia, 2003),

Professional Training:
- Acupuncture, Reflexotherapy, Reflexology, Russian State Medical University (1999; 1996, 1988),
- Extremely High Frequency- (EHF) Therapy, Scientific-Methodical Center “EHF”, USSR Academy of Sciences (1987-1991).
- Classic Acupuncture and Pulse Diagnosis, Medical League, Moscow (1996),
- Lazer Medicine, Russian Medical Academy (1998),
- Extremely High Frequency (EHF) Puncture, Russian Medical Academy (1998);
- Advanced Acupuncture Manipulation Technique, Ontario College of Traditional Chinese Medicine (2008);

In 1991, Dr. M. Teppone prepared a thesis on completing his Ph.D. in medicine: "*Method of Multi-zone EHF-Therapy in the group of patients with Duodenal ulcers*."

Results of the study were published in 1991:

Teppone M.V., et al. *Ultrahigh frequency therapy of duodenal ulcer* [Крайне высокочастотная терапия язвенной болезни двенадцатиперстной кишки]. Klin Med (Mosk). 1991 Oct; 69(10): 74-7. https://pubmed.ncbi.nlm.nih.gov/1766225/ PMID: 1766225

After collapse of the Soviet Union completing PhD was delayed and then canceled ...

Some documents related to the preparation for completing Ph.D. ... see on p. 642-646

Participation at the Conferences and Congresses

Before being involved into the Organotherapy project in 2012, Dr. Mikhail participated at the Conferences and Congresses in Beograd, Yugoslavia (1991); Kyoto, Japan (1991); Beijing, China (1991, 2005); Moscow, Russia (1991, 1995, 1998, 2003, 2004, 2007); Bucharest, Romania (1991); Chishinew, Moldova (1994); Edmonton, Canada (1995); Singapore (1995, 2000); Los Angeles, USA (1996); Nicosia, Cyprus (1997); Saint Petersburg, Russia (1997); Jurmala, Lithvinia (1998); Riga, Latvia (1999); Vienna, Austria (2000); Bled, Slovenia (2001); Beirut, Libanon (2003); Aurangabad, India (2004); Toronto, Canada (2006; 2007; 2008); Phoenix, USA (2006); Portland, USA (2007); Washington, USA (2008), etc.

Since 2012, Dr. Teppone took part at various Conferences and Exhibitions dealing with the fields of Anti-aging medicine, Regenerative medicine and Organotherapy

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I. Books and Manuals:

(PDF p)

1. (17) M.Teppone, **Traditional Chinese medicine and Dynamic electrotherapy**. – Moscow, 2012, p. 368, illustr. (Russ); ISBN: 5-98857-219-7; Традиционная Китайская Медицина и Динамическая Электротерапия. – М.: Профит Стайл, 2012, 368 с. https://archive.org/details/electrotherapy-and-tcm

2. (19) M.Teppone, R.Avakian. **Practical Handbook on EHF-Therapy.** – Moscow: New Medical Technologies, Практическое Руководство по КВЧ – Терапии. – М.: Новейшие медицинские технологии, 2001, 66 с.

3. (24) M. Teppone, R. Avagyan. **Modern Technology in Traditional Oriental Medicine**. – Moscow, ZAO MILTA-PKP GIT, Humanitarian Information Technology, 2001, 72 p.

4. (27) M.Teppone, **Extremely High Frequency (EHF)-Puncture**. – Moscow, 1997, 315 p. illustr (Russ); ISBN: 5-7333-0392-1; Крайне Высоко Частотная (КВЧ) Пунктура. https://archive.org/details/TepponeMikhail.ExtremelyHighFrequencyehfPuncture1997

II. Collections of articles, documents, news, etc:

5. (29) M. Teppone. **Definition of Pandemic on the WHO website**. A Collection of articles, documents, news, and remarks on the history of changing the definition of a pandemic on the WHO website. – July, 2023, 160 pages. DOI: 10.13140/RG.2.2.11046.29760/1 https://archive.org/details/definitionof-pandemic

6. (31) M. Teppone. **Two Viruses in One Vaccine**: A Collection of articles, documents, news, and remarks on the history of the vaccine against seasonal flu which contained live avian flu viruses. – March-July, 2023, p. 381. DOI: 10.13140/RG.2.2.14169.60009/2 https://archive.org/details/electrotherapy-and-tcm

III. Abstracts, Articles and Reports done at the Conferences:

7. (34) M.Teppone. **Definition of a Pandemic**: The Cause and Consequence of its Adjustment in 2009 and 2011. Probl Sotsialnoi Gig Zdravookhran. Istor Med. 2024 Aug; 32(4): 291-297 [DOI: http://dx.doi.org/10.32687/0869-866X-2024-32-4-691-697]

8. (41) M.Teppone. **Definition of a Pandemic**: The Causes and Consequences of its Adjustment in 2009 And 2011; May 30, 2024, p. 1-27; Preprint: http://dx.doi.org/10.2139/ssrn.4848086 // https://ssrn.com/abstract=4848086

9. (68) M.Teppone. **Organotherapy with placenta: past and present**. Int J Complement Alt Med. 2023;16(6): 326-333. DOI: 10.15406/ijcam.2023.16.00671 https://medcraveonline.com/IJCAM/organotherapy-with-placenta-past-and-present.html

10. (76) M.Teppone. **Acupoints, Channels and Organs**. – Preprint, 27 Oct 2023; https://www.preprints.org/manuscript/202310.1820/v1

11. (113) M.Teppone. **Nano-Organotherapy: Precision Medicine with Organ Specific Nano -Peptides**. 2nd Intern Conf Precision Health in the Industrial Revolution. – Hospital Al-Sultan Abdullah, UiTM, iPROMISE, Kuala Lumpur, 27 Aug 2023. – J of Clinical health Sciences, 2024, 9(1), S6; Supplementary - https://doi.org/10.24191/jchs.v9i1(S).25791

12. (114) M.Teppone. **History of advances in genetic engineering of viruses before COVID-19 pandemic**. Surg Neurol Int. 2023 Mar 24;14:109.
doi: 10.25259/SNI_36_2023 // https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10070288/

13. (123) M.Teppone. **Phase Dynamics of the Covid-19 Pandemic** (part 2). A Systematic Analysis of 213 Countries and Territories. Report 2. Probl Sotsialnoi Gig Zdravookhranenniiai Istor Med. 2022 Jul;30(4):531-536. doi: 10.32687/0869-866X-2022-30-4-531-536. PMID: 35960278. https://pubmed.ncbi.nlm.nih.gov/35960278/
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15. (138) М.Теппоне. **Три Фазы пандемии**: Динамика случаев, смертей и тестов, связанных с SARS-CoV-2; Систематический анализ 213 стран и территорий (Пер. на русс. язык preprint. - 0185/v4) RGate, Sep 2024; DOI:10.13140/RG.2.2.21340.40327

16. (215) M.Teppone. **COVID-19: Three Phases of the Pandemic:** Dynamics of Cases, Deaths and Tests Related to SARS-CoV-2 A Systematic Analysis of 213 Countries and Territories. Preprints 2021, 2021070185 (doi: 10.20944/preprints202107.0185.v4).
https://www.preprints.org/manuscript/202107.0185/v4

17. (258) M.Teppone. **One Year of COVID-19 Pandemic**: Case Fatality Ratio and Infection Fatality Ratio. A Systematic Analysis of 219 Countries and Territories. Preprints 2021, 2021070185 (doi: 10.20944/preprints202107.0185.v1).
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18. (271) M.Teppone. [**The weekly cycle of mortality among patients with COVID-19**]. Probl Sotsialnoi Gig Zdravookhranenniiai Istor Med. 2021 Jan; 29 (1): 14-24 (Rus); doi: 10.32687/0869-866X-2021-29-1-14-24. // М. Теппоне. Недельный цикл смертности среди пациентов с COVID-19. - Проблемы социальной гигиены, здравоохранения и истории медицины. 2021;29(1):14-24.

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20. (305) M.Teppone, **Organotherapy, its Past, Present and Future**. – Inaugural International MAAFIM Conference, Jan 10-12, 2020; Dorset Grand Subang, Subang Jaya, Selangor, Malaysia. – Proceedings of the Conference, 2020 (Jan 12): 67-68.
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21. (307) M.Teppone. **Medicine has always been «Modern» and «Scientific» from ancient times to the present day**. - Journal of integrative Medicine, 2019, Jul, 17(4): 229-237. DOI: 10.1016/j.joim.2019.03.008; https://pubmed.ncbi.nlm.nih.gov/30967348/

22. (316) M.Teppone. **Nano Peptides Range: Similarity and Difference**. – 3rd World Congress on Anti-Aging, Aesthetic, Regenerative, Nutritional and Exercise Medicine (WAAARNEM), in conjunction with the 16th Malaysian Conference and Exhibition & 9th International Congress on Anti-Aging, Aesthetic and Regenerative, Medicine. – April 26-28, 2019, Sheraton Imperial Kuala Lumpur, Malaysia (Report).

23. (318) M.Teppone. **Application of Placenta Origin Peptides to Support Cellular Energy**. – 3rd World Congress on Anti-Aging, Aesthetic, Regenerative, Nutritional and Exercise Medicine (WAAARNEM), in conjunction with the 16th Malaysian Conference and Exhibition & 9th International Congress on Anti-Aging, Aesthetic and Regenerative, Medicine. – April 26-28, 2019, Sheraton Imperial Kuala Lumpur, Malaysia (Report).

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25. (327) M.Teppone, R. Avakian. **Modern Interpretation of Traditional Chinese Medicine Theory**. - Medical Acupuncture, 2009, 21(3): 201-206. DOI: 10.1089/acu.2009.0690;

26. (333) M.Teppone. **Antel is a Modern Diagnostic Tool for everyday practice and Scientific Study in TCM Field**. – 2008 International Conference on Integrative Medicine. – EBNMP Canada & USA, Hilton Garden Inn, Vaughan, ON, October 19, 2008.

27. (337) M.Teppone, R.Avakyan. **Modern Interpretation of TCM Theory**. – 20th Annual Symposium for Medical Acupuncture. April 11-13, 2008, Washington, DC, USA; Handbook of Faculty Syllabus Materials, AAMA, 2008, p. 350-352 (poster).

28. (340) M.Teppone, R.Avakyan, A.Markov. **Study of the parameters influencing brightness of luminescence of minimal resistance points**. – 20th Annual Symposium for Medical Acupuncture. April 11-13, 2008, Washington, DC, USA; Handbook of Faculty Syllabus Materials, AAMA, 2008, (poster).

29. (346) M.Teppone, R. Avakian. **Modern View on the Theory of Channels, Collaterals and Organs**. - Medical Acupuncture, 2007, 19(1): 43-48. DOI: 10.1089/acu.2006.507;

30. (352) M.Teppone, R. Avakian. **Modern View on the Theory of Channels, Collaterals and Organs**. - Traditional Medicine - 2007, Digest of Papers: A Congress dedicated to the 30th anniversary of the opening of the Central Research Institute of Reflexology, Moscow, March 1-3, 2007, p. 488-492 (Rus) // Новый взгляд на теорию каналов, коллатералей и органов. − Традиционная медицина – 2007, Сб. тр. конгресса, посвященного 30-летию со дня открытия ЦНИИ Рефлексотерапии, Москва, 1-3 марта, 2007, с. 488-492.

31. (358) M.Teppone, R.Avakyan. **Detection and Visualization of low resistance point of the skin by the AcuVision device**. – IN CAM Mini-Symposium. From Experience to Evidence, Montreal, Quebec, February 2, 2007 (Poster).

32. (359) M.Teppone, R.Avakyan, **EHF-Therapy of Lower Back Pain Syndrome.** – The 11th International Scientific and Practical Conference on Quantum Medicine; New Medical Technologies and Quantum Medicine. January 24-27, 2005 (reports), p. 71-72 (Rus). // КВЧ – Терапия поясничного болевого синдрома. – 11-я Международная научно-практическая конференция по квантовой медицине. Москва, 24-27 января, 2005, (сб. докладов), с. 71-72.

33. (204) M.Teppone, R.Avakyan, **Visualization of Acupoints by AcuVision device**. – The 5th International Congress of Medical & Cosmetic Acupuncture-Acupressure. Aurangabad, December 3-6, 2004. p. 16-17.

34. (354) M.Teppone, R.Avakyan, **Can a modern physician understand traditional Chinese medicine?** - Theoretical and clinical aspects of Bio-resonance and multi-resonance therapy application: X International Congress, Moscow, 2004, part II, p. 395-400 // Может ли современный врач понять традиционную китайскую медицину? − X Международная конференция: «Теоретические и клинические аспекты применения биорезонансной и мультирезонансной терапии», Москва, 16-18 апреля, 2004, сб. докл., часть II, с. 395-400.

35. (370) M.Teppone, R.Avakyan, **Modern Aspects of Quantum and Traditional Chinese Medicine**. – The 10th International Scientific and Practical Conference on Quantum Medicine. December 1-5, 2003 (reports), p. 117-119 (Rus). // Современные аспекты квантовой и традиционной китайской медицины. − 10-я Международная научно-практическая конференция по квантовой медицине. Москва, 1-5 декабря, 2003 (сб. докл.), с. 117-119.

36. (373) M.Teppone, R.Avakyan, **EHF-Therapy and Modern Aspects of Traditional Chinese Medicine**. – Millimeter Waves in Medicine and Biology. The 13th Russian Symposium with Foreign Scientists, December 1-3, 2003, Zvenigorod, Moscow (reports), p. 62-64 (Rus). // КВЧ-терапия и современные аспекты традиционной китайской медицины. – Миллиметровые волны в медицине и биологии. 13-й Российский симпозиум с международным участием, 1-3 декабря, 2003, Звенигород, – Сборник докладов, Москва, 2003, с. 62-64.

37. (377) M.Teppone, R.Avakian. **Quantum therapy in the physiotherapy field**: What's new in Physiotherapy – 2003, Beyrouth, Liban, Sept 6-7 2003, p. 31 // Le Congres Annuel International de l'Ordre des Physiotherapeutes au Liban, Setember, 6-7, 2003, p. 31.

38. (378) M.Teppone, R.Avakyan, **Standard Description of EHF-therapy**. – Millimeter Waves in Biology and Medicine. 2003, N 2 (30), p. 50-59 (Rus). // Стандартное описание методик КВЧ-терапии. - Миллиметровые волны в биологии и медицине. – М.: МТА «КВЧ», 2003, 30(2): 50-59. // Стандартное описание методик КВЧ – терапии. – «Миллиметровые волны в биологии и медицине» – 2003, № 2 с. 50-59.

39. (388) M.Teppone, R.Avakyan, **Extremely High Frequency (EHF) Therapy in Oncology** (review). – Millimeter Waves in Biology and Medicine. 2003, N 1 (29), p. 3-19 (Rus). // Крайне высокочастотная (КВЧ) - терапия в онкологии (обзор литературы). – «Миллиметровые волны в биологии и медицине», 2003, № 1, с. 3–19.

40. (405) M.Teppone, R.Avakyan, I.Karneev. **Phenomenon of «De Qi» or Sensory reactions during EHF-Puncture**. – The 1st International Symposium «Quantum Medicine and New Medical Technologies», November 17-22, 2001, Bled, Slovenia, p. 116-118 // (261) Феномен «De Qi» или сенсорные реакции при проведении КВЧ-пунктуры. - I-й Международный симпозиум «Квантовая медицина и новые медицинские технологии». – 17-22 ноября, 2001, Блед, Словения, с. 116-118

41. (412) M.Teppone, R.Avakyan. **Modern diagnostic technology applied in Acupuncture.** - ICMART Congress 2000: 9th World Congress on Scientific Acupuncture and Related Techniques; May 11-14, 2000, Palais Auersperg, Vienna, Austria, p. 31-32. https://icmart.org/icmart-congress-2000-vienna-austria/modern-diagnostic-technology-applied-in-acupuncture/

42. (415) M.Teppone, S.Elmen, O.Bugaev, R.Avagyan. **Modern Approach to differentiate a Diagnosis of TCM**. – ICMART 2000: The 9th World Congress of Medical Acupuncture and Related Techniques, May 11-14, 2000, Palais Auersperg, Vienna, Austria, p. 33-34. https://icmart.org/icmart-congress-2000-vienna-austria/modern-approach-to-differentiate-diagnosis-of-tcm/

43. (414) M.Teppone, R.Avakian, A.J.Scott–Morley. **EHF – Puncture: Integration of East and West Modern Diagnostic & Therapeutic Microwave Equipment**. – The 5th International Congress of Traditional Medicine & Acupuncture, Singapore, March 18-19, 2000 p. 81-87.

44. (421) M.Teppone, R.Avagyan, S.Vesnin, S.Elmen. **EHF-Puncture on the Points of the Palm**. – VI All-Russian Conference on Quantum Medicine, Moscow. 1999). – Moscow, 2000, p. 87-88. КВЧ–Пунктура по точкам, лежащим на линиях ладони. – VI Всероссийская научно-практическая конференция по квантовой терапии, Москва, 1999. – Москва, 2000, с. 87-88.

45. (425) M.Teppone, R.Avagyan, S.Elmen, S.Vesnin, **Extremely High Frequency (EHF) Puncture & Related Technique**. – The Challenge of Acupuncture: ICMART International Symposium on Medical Acupuncture and Related Techniques, Riga, May 21-23, 1999, p. 55.

46. (426) M.Teppone, R.Avakian. **Main features of EHF-puncture**. – Theoretical and clinical aspects of the use of bio-resonance and multi-resonance therapy; V International Conference. – Moscow, April 16-18, 1999, Part II, p. 287-288 // Основные особенности КВЧ - Пунктуры. – «Теоретические и клинические аспекты применения биорезонансной и мультирезонансной терапии», V Международная конференция, Москва, 16-18 апреля 1999. – М.: Имедис, 1999, Часть II, с. 287-288.

47. (427) M.Teppone, R.Avakian. **ACUVISION – new decision in visualization of acupuncture points**. - Theoretical and clinical aspects of the use of bio-resonance and multi-resonance therapy; V International Conference. – Moscow, April 16-18, 1999, Part II, p. 288-289 // ACUVISION – новое решение визуализации точек Акупунктуры. – «Теоретические и клинические аспекты применения биорезонансной и мультирезонансной терапии», V Международная конференция, Москва, 16-18 апреля 1999. – М.: Имедис, 1999, Часть II, с. 288-289.

48. (428) M.Teppone, R.Avakian. **Traditional Oriental Pharmacy and EHF-Puncture**. - V All-Russian Conference on Quantum Medicine, Moscow, Dec 8-11 1998, (abstracts), p. 45-46 (Rus). // Традиционная восточная фармакология и КВЧ-пунктура. – V Всероссийская научно-практическая конференция по квантовой терапии, Москва, 8-11 декабря 1998, (сб. докл.), с. 45-46.

49. (431) M.Teppone, R.Avakian. **The Theory of «Roots and Knots» (Lin Shu, Chapter 5):** A New Version of the Subject. – Acupuncture in Modern Society, The 5th International Baltic Congress on Medical Acupuncture and Related Techniques, Jurmala, May 28-31, 1998, (abstracts), p. 55-56.

50. (433) M.Teppone, R.Avakian. **The Modern Aspects of EHF-Puncture**. – Acupuncture in Modern Society. – The 5th International Baltic Congress on Medical Acupuncture and Related Techniques, Jurmala, May 28-31, 1998, p. 56.

51. (434) M.Teppone, L.Novikova. **Luo Vessels (collaterals): A New Perspective.** – American Journal of Acupuncture, 1998; 26(2/3): 129-38.

52. (444) M.Teppone, R.Avakian. **Variants of EHF-Therapy Methods**. – Fundamental Sciences and Alternative Medicine. First International Symposium. Sept 22-25, 1997. Abstracts. - Pushchino, 1997, p. 108 (Rus) // Методики КВЧ-терапии. – Фундаментальные науки и альтернативная медицина, 22-25 сентября, 1997, Пущино, (тез) с. 108.

53. (445) M.Teppone, R.Avakian, L.Novikova. **EHF-Puncture & Microsystems**. Acupuncture White Nights, The 2nd European Congress, May 27-30, 1997, Saint Petersburg, Russia. p. 177-178. (Rus) // КВЧ-Пунктура и Микросистемы. – «Акупунктурные Белые Ночи», Второй Европейский Конгресс, 27-30 мая 1997, С.-Петербург, (тез. докл., том II), с. 177-178.

54. (446) M.Teppone, R.Avakian, **MM Wave Therapy Technologies and Traditional Chinese Medicine**. – Millimeter Waves in Medicine and Biology. The 11th Russian Symposium with Foreign Scientists, April 21-24, 1997, Zvenigorod, Moscow (reports), p. 87-89 (Rus) // Методики КВЧ-терапии и традиционная китайская медицина. – Миллиметровые волны в медицине и биологии. XI Российский симпозиум с международным участием, 21-24 апреля 1997, Звенигород, (сборник докладов), М.: с. 87-89.

55. (450) M.Teppone, R.Avakian, **EHF-Puncture on the Pulse Zone**. – Millimeter Waves in Medicine and Biology. The 11th Russian Symposium with Foreign Scientists, April 21-24, 1997, Zvenigorod, Moscow (reports), p. 90-92 (Rus). // КВЧ-пунктура на область пульса. – Миллиметровые волны в медицине и биологии. XI Российский симпозиум с международным участием, 21-24 апреля 1997, Звенигород, (сб. докл.), М.: с. 90-92.

56. (453) M.Teppone, R.Avagyan, **A New Version of Pulse Diagnostic Technique & EHF – Puncture on the Pulse Points**. – ICMART '97 VII International Medical Acupuncture Symposium, Nicosia, Cyprus, March 26-29, 1997, p. 109.

57. (455) M.Teppone, R.Avakian, **Variants of EHF-Therapy Methods.** - The 3rd All-Russian Scientific and Practical Conference on Quantum Medicine. December 17-20, 1996, Moscow, (reports), p. 25-26 (Rus). // **Варианты ММ-волновой терапии**. – III Всероссийская научно-практическая конференция по квантовой терапии, Москва, 17-20 декабря 1996, (сб. докладов), с. 25-26.

58. (457) M.Teppone, R.Avakian, **EHF / MMW-Puncture of Acute Diseases**. - The 3rd All-Russian Scientific and Practical Conference on Quantum Medicine. December 17-20, 1996, Moscow, (reports), p. 30-32 (Rus). // КВЧ / ММВ-пунктура острых заболеваний. – III Всероссийская научно-практическая конференция по квантовой терапии, Москва, 17-20 декабря 1996, (сборник докладов), с. 30-32.

59. (460) M.Teppone, A. Krotenko. **Extremely High Frequency (EHF) Puncture Therapy and Syndromes of Traditional Chinese Medicine**. - World J. Acupuncture-Moxibustion, 1996, 6 (1): 9-16.

60. (469) M.Teppone, L. Novikova, S. Grigoriev, R. Avakian, **Extremely High Frequency (EHF) Therapy**. - Complementary Medicine International, 1996, 3 (1): 29-35.

61. (477) M.Teppone. **The State of Acupuncture in Modern Russia**. – The Magazine of the Anglo-Dutch Institute for Oriental Medicine, Summer '96, 6: 8-9.

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M. Teppone

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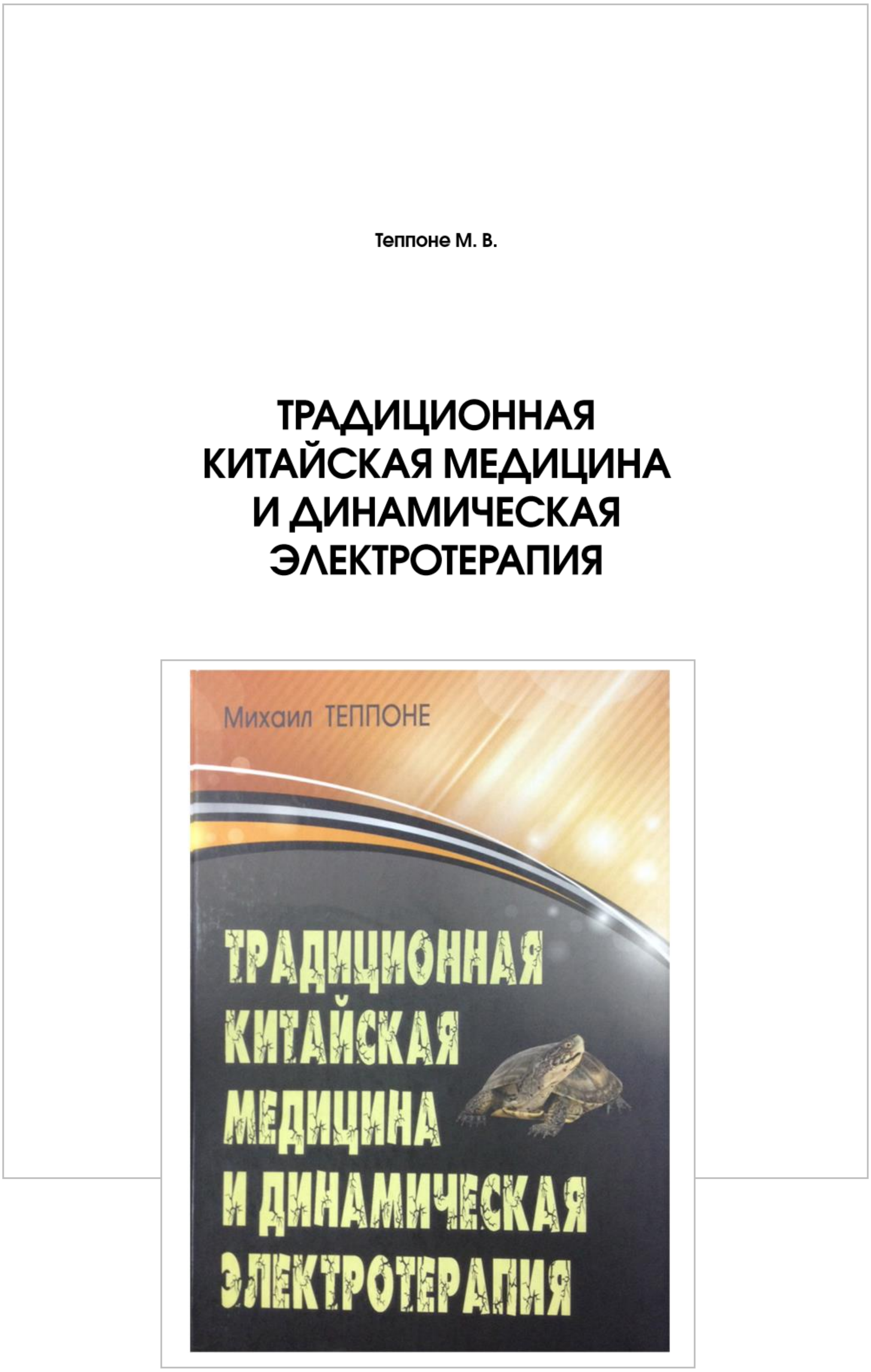

Теппоне М. В.

ТРАДИЦИОННАЯ
КИТАЙСКАЯ МЕДИЦИНА
И ДИНАМИЧЕСКАЯ
ЭЛЕКТРОТЕРАПИЯ

Михаил ТЕППОНЕ

ТРАДИЦИОННАЯ
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Книга содержит историю внедрения традиционной китайской медицины и электротерапии в Европе и в России.

Основную часть книги составляет современное объяснение различных теорий традиционной китайской медицины с акцентом на их практическое использование при проведении иглоукалывания, прижигания и динамической электротерапии.

Книга рассчитана на врачей различных специальностей, применяющих иглоукалывание, динамическую электротерапию и другие современные методы воздействия на точки акупунктуры.

Теppone M. V. Traditional Chinese medicine and dynamic electrotherapy.

The book contains the history of implementation of traditional Chinese medicine and electrotherapy in Europe and in Russia.

The main part of the book is devoted to the modern explanation of the various theories of traditional Chinese medicine with the emphasis on their practical use in acupuncture, moxibustion and dynamic electrotherapy.

The book is designed for physicians of various specialties, applying acupuncture, dynamic electrotherapy and other modern methods of acupoints stimulation.

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Практическое Руководство по КВЧ - Терапии

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Ассоциация "Квантовая Медицина"
Институт квантовой медицины
ЗАО "МИЛТА-ПКП ГИТ"

Михаил ТЕППОНЕ
Ромен АВАКЯН

ПРАКТИЧЕСКОЕ РУКОВОДСТВО
ПО
КВЧ-ТЕРАПИИ

Москва 2001

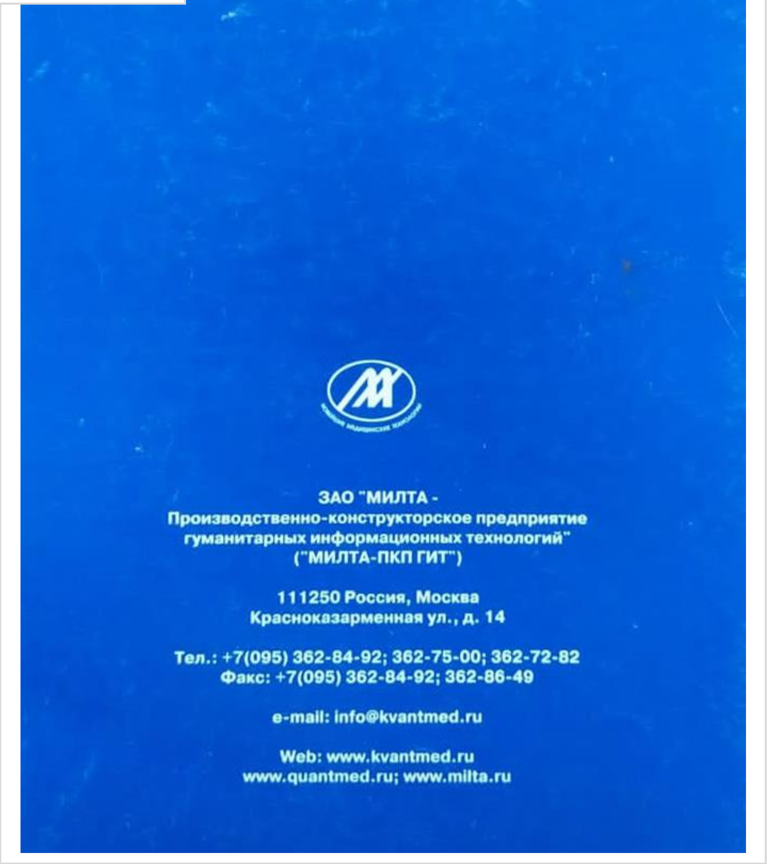
Михаил Теппоне, Ромен Авакян

ПРАКТИЧЕСКОЕ РУКОВОДСТВО

по

КВЧ – ТЕРАПИИ

Москва
2001



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Производственно-конструкторское предприятие
гуманитарных информационных технологий"
("МИЛТА-ПКП ГИТ")

111250 Россия, Москва
Красноказарменная ул., д. 14

Тел.: +7(095) 362-84-92; 362-75-00; 362-72-82
Факс: +7(095) 362-84-92; 362-86-49

e-mail: info@kvantmed.ru

Web: www.kvantmed.ru
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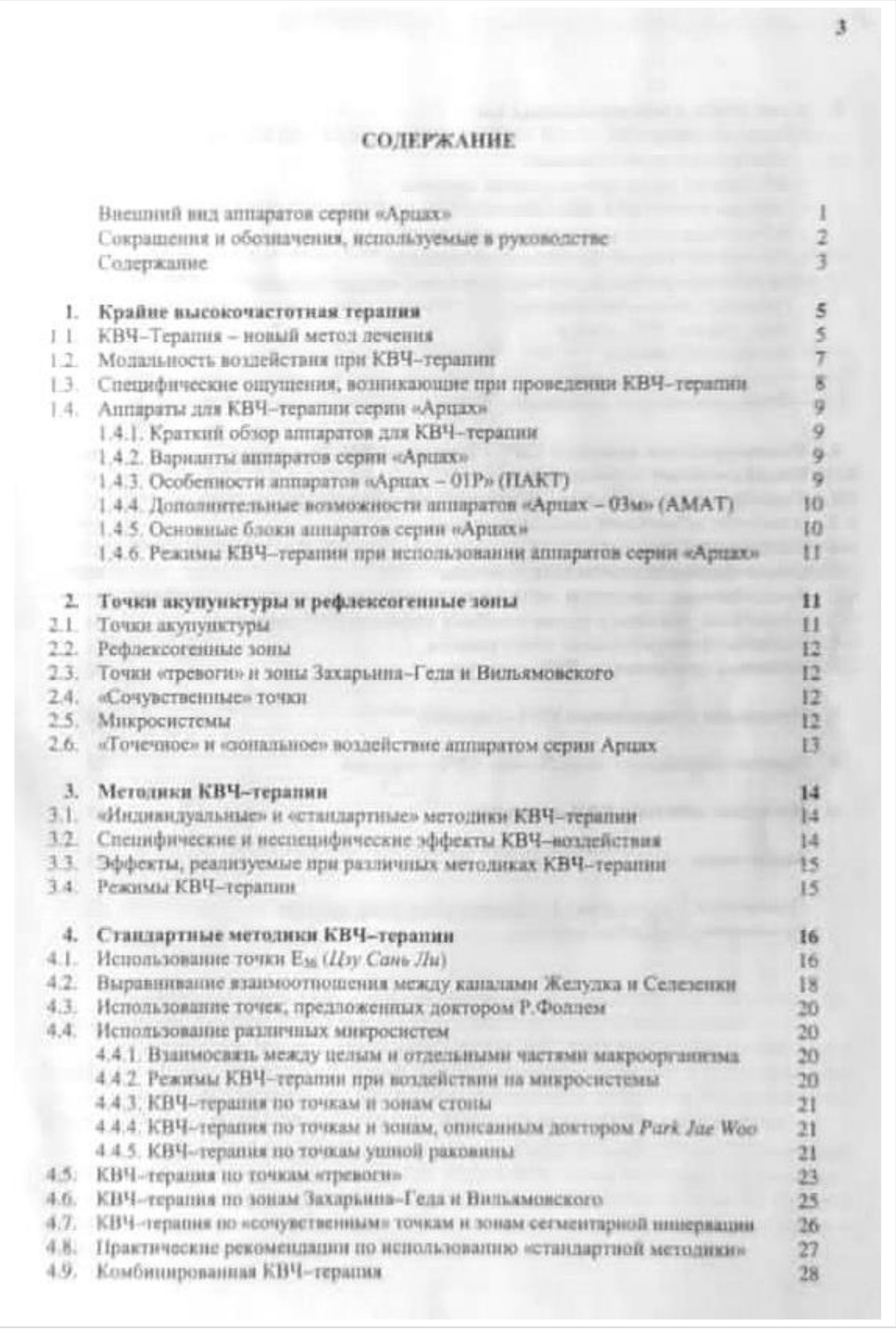

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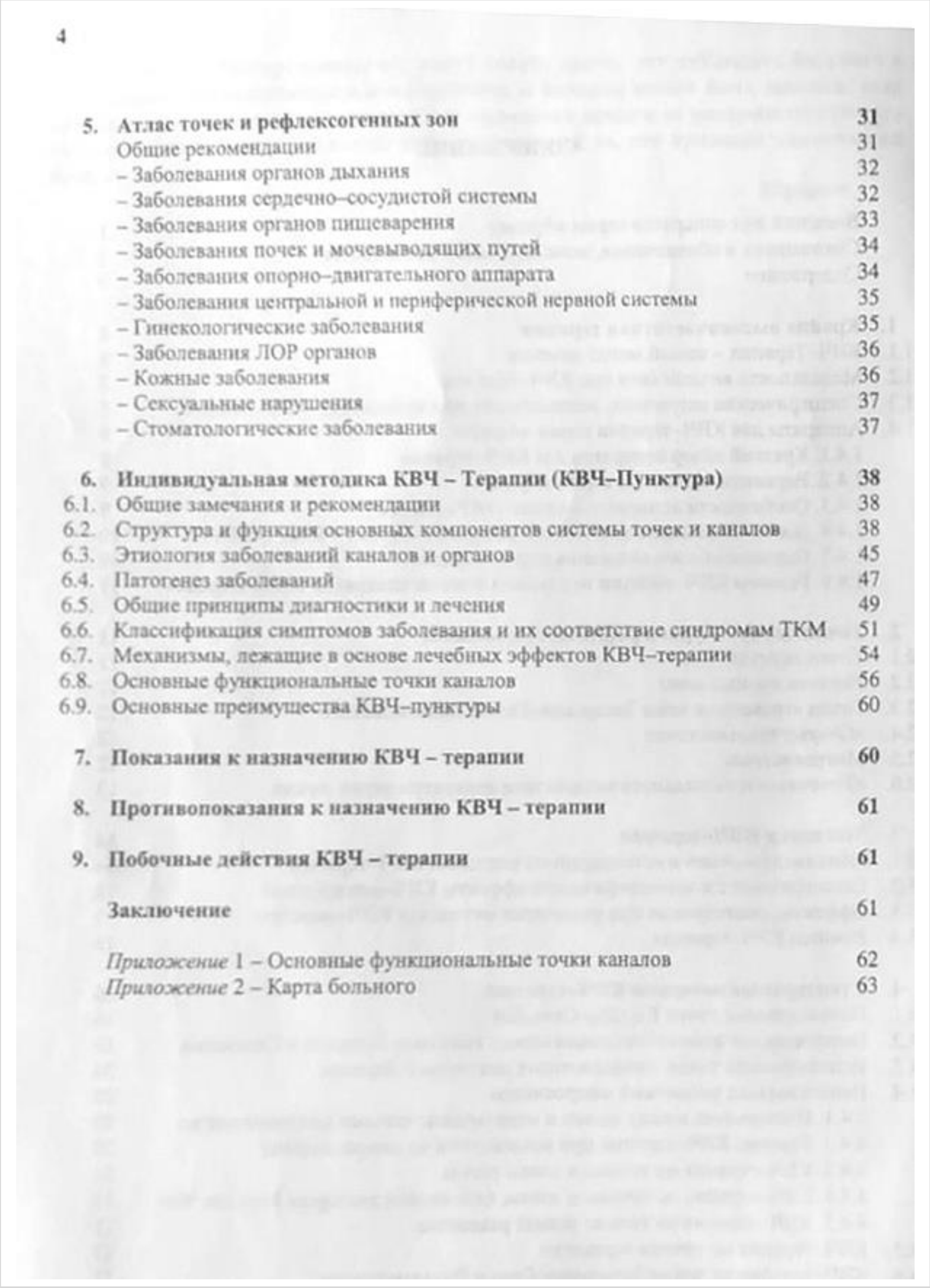

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1. КРАЙНЕ ВЫСОКОЧАСТОТНАЯ ТЕРАПИЯ

1.1. КВЧ-ТЕРАПИЯ — НОВЫЙ МЕТОД ЛЕЧЕНИЯ

Крайне высокочастотная (КВЧ) или миллиметровая (ММ) терапия является новым методом лечения, основанным на различных биологических эффектах низко интенсивного электромагнитного излучения (ЭМИ) миллиметрового диапазона.

Метод доказал свою высокую эффективность при лечении широкого круга заболеваний органов пищеварения, органов дыхания, сердечно-сосудистой системы, нервной системы, опорно-двигательного аппарата, а также в педиатрии, наркологии, дерматологии и психиатрии.

На шкале ЭМИ КВЧ-диапазон располагается между инфракрасным излучением и сантиметровыми радиоволнами и включает частоты от 30 до 300 ГГц или длины волн от 10 до 1 мм.

В лечебной практике применяется когерентное излучение, при котором ЭМИ имеет определенную частоту и фазу, и «шумовое», которое является широкополосным излучением со случайно изменяющимися амплитудами и фазами волн.

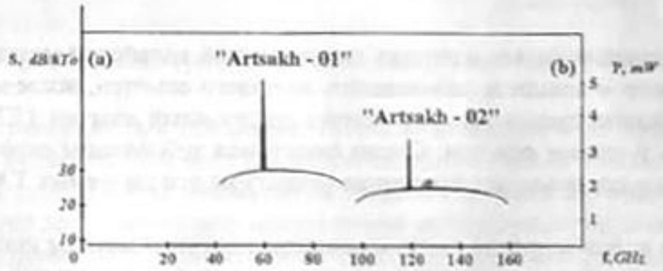


Рисунок 1. Спектральная плотность мощности «шумового» излучения (a) и выходная мощность когерентного излучения (b) аппаратов серии «Арцах».

Используемые в медицине мощности излучения не превышают 1,0—10,0 mW. Глубина проникновения ММ ЭМИ в кожу и другие ткани не превышает 0,2-0,5 мм.

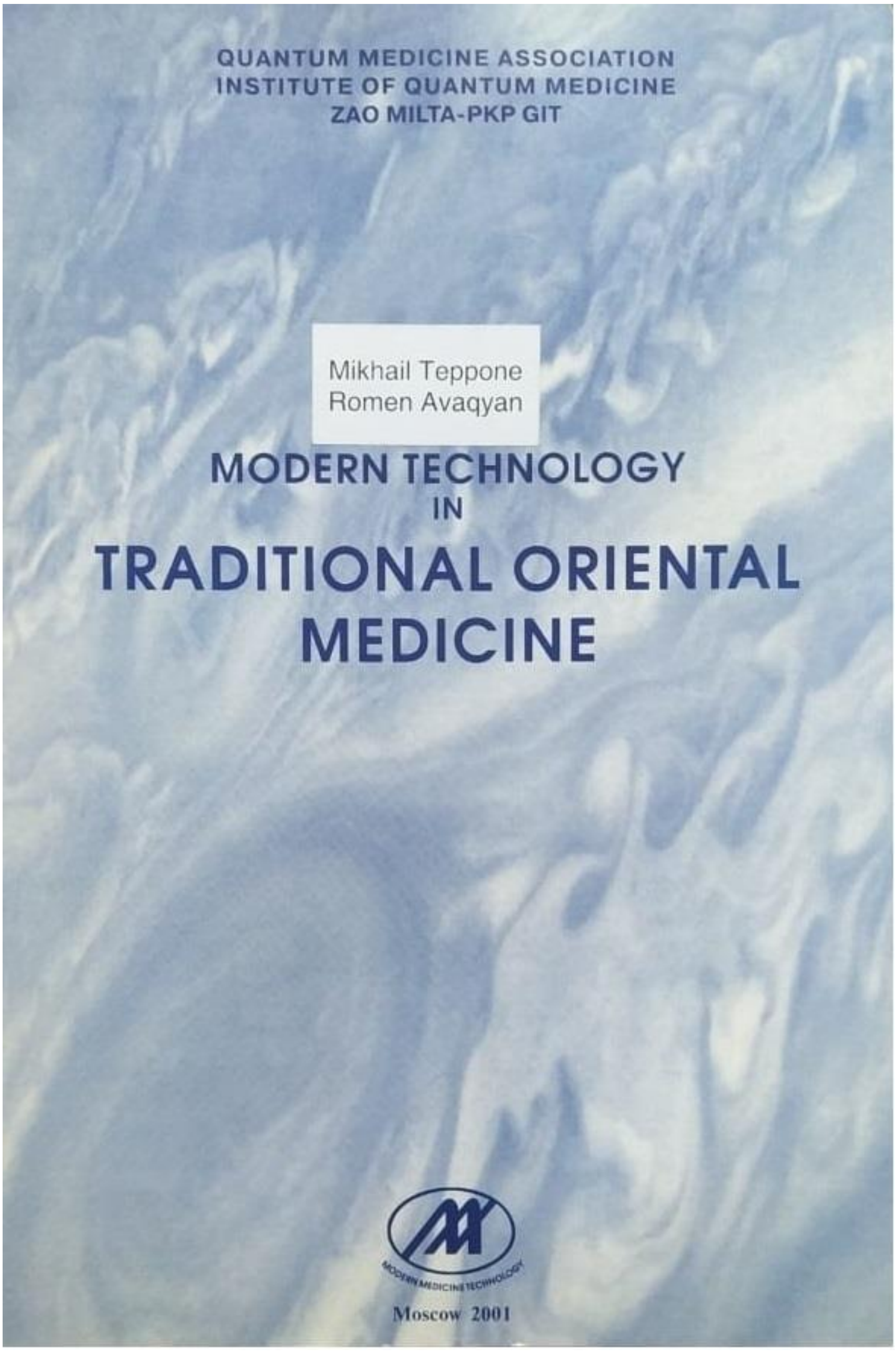
Предполагается, что первичной мишенью для ММ ЭМИ являются молекулы воды. Изменение степени гидратации белков клеточной мембраны приводит к их конформационным изменениям, что отражается на ионном транспорте и активности АТФ-синтетазы. Синтез АТФ и ее накопление обуславливает физиологические эффекты стимуляции.

По мнению профессора С.Ситько у каждого биологического объекта существуют собственные «характеристические частоты». Воздействие этими частотами сопровождается резонансным откликом организма и коррекцией нарушенного гомеостаза. Распространение ММ волн в организме человека и животных происходит по «каналам», описанным в традиционной китайской медицине (ТКМ).

Modern Technology in Traditional Oriental Medicine

M. Teppone, R. Avagyan

ZAO MILTA-PKP GIT, Moscow
M.: Humanitarian Information Technology, 2001, 72 p.



QUANTUM MEDICINE ASSOCIATION
INSTITUTE OF QUANTUM MEDICINE
ZAO MILTA-PKP GIT

Mikhail Teppone
Romen Avaqyan

MODERN TECHNOLOGY
IN
TRADITIONAL ORIENTAL
MEDICINE

MODERN MEDICINE TECHNOLOGY

Moscow 2001

Diagnostic Equipment

This manual deals with the successful integration of the ancient theory of Traditional Oriental Medicine and Modern Quantum Technology.

It includes the theory of Oriental medicine as well as a description of Modern Diagnostic and Therapeutic equipment.

The special atlas of some acupoints and reflex zones is presented at the end. It can be used for the therapy of various symptoms and diseases.

Therapeutic Equipment

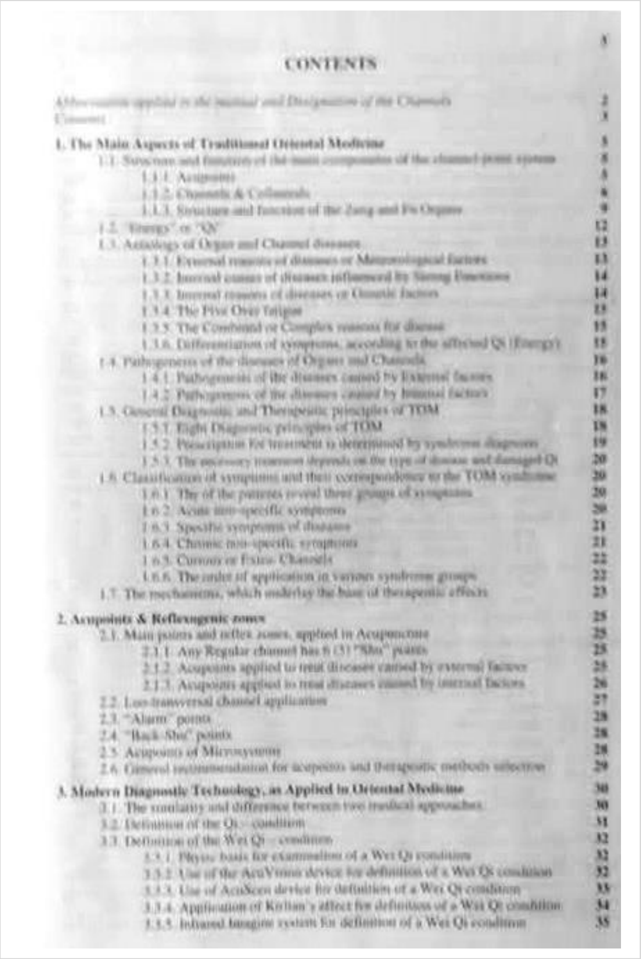
ZAO MILTA-
HUMANITARIAN-INFORMATION TECHNOLOGY
DESIGN AND PRODUCTION COMPANY
(MILTA-PKP GIT)

Krasnokazarmennaya, 14, Moscow, Russia, 111250

Phone: +7(095) 362-84-92; 362-75-00
Fax: +7(095) 362-84-92; 362-86-49

e-mail: info@kvantmed.ru

Web: www.kvantmed.ru
www.quantmed.ru; www.milta.ru



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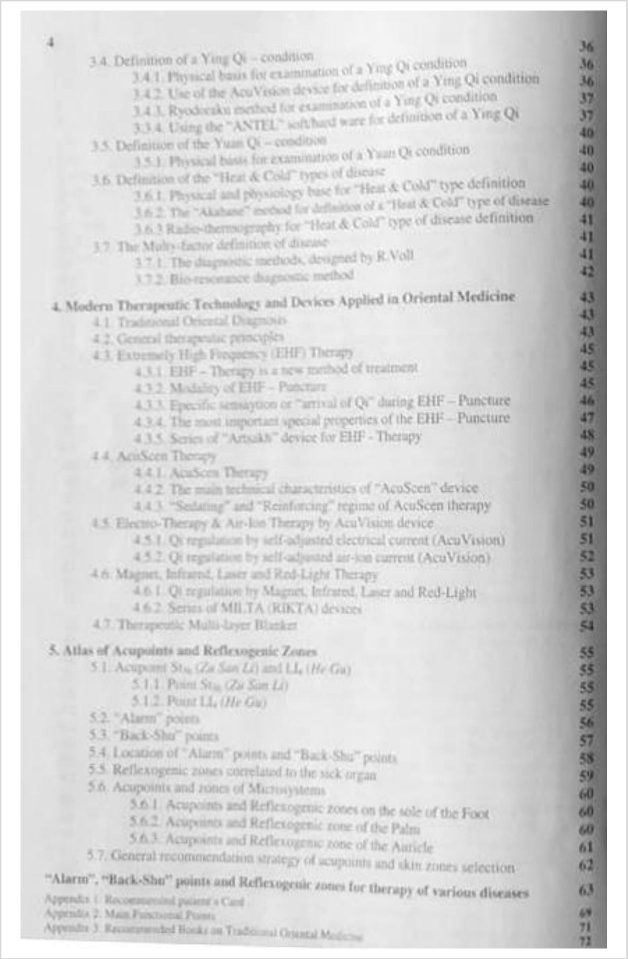

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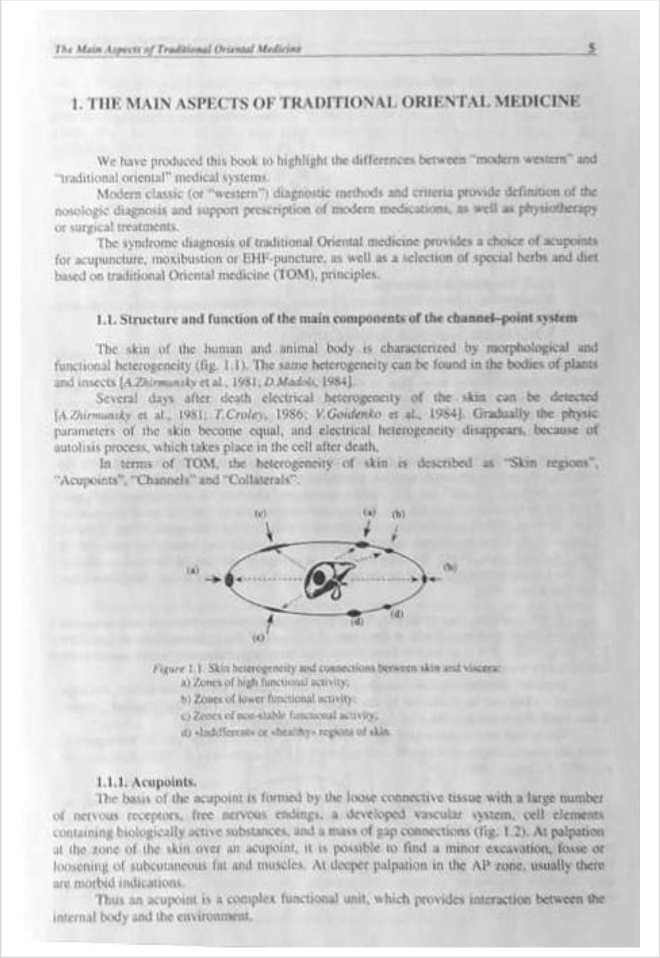


1. THE MAIN ASPECTS OF TRADITIONAL ORIENTAL MEDICINE

We have produced this book to highlight the differences between "modern western" and "traditional oriental" medical systems.

Modern classic (or "western") diagnostic methods and criteria provide definition of the nosologic diagnosis and support prescription of modern medications, as well as physiotherapy or surgical treatments.

The syndrome diagnosis of traditional Oriental medicine provides a choice of acupoints for acupuncture, moxibustion or EHF-puncture, as well as a selection of special herbs and diet based on traditional Oriental medicine (TOM), principles.

1.1. Structure and function of the main components of the channel–point system

The skin of the human and animal body is characterized by morphological and functional heterogeneity (fig. 1.1). The same heterogeneity can be found in the bodies of plants and insects [*A.Zhirmunsky* et al., 1981; *D.Madoli*, 1984].

Several days after death electrical heterogeneity of the skin can be detected [*A.Zhirmunsky* et al., 1981; *T.Croley*, 1986; *V.Goidenko* et al., 1984]. Gradually the physic parameters of the skin become equal, and electrical heterogeneity disappears, because of autolisis process, which takes place in the cell after death.

In terms of TOM, the heterogeneity of skin is described as "Skin regions", "Acupoints", "Channels" and "Collaterals".

Figure 1.1. Skin heterogeneity and connections between skin and viscera:
a) Zones of high functional activity;
b) Zones of lower functional activity;
c) Zones of non-stable functional activity;
d) «Indifferent» or «healthy» regions of skin.

1.1.1. Acupoints.

The basis of the acupoint is formed by the loose connective tissue with a large number of nervous receptors, free nervous endings, a developed vascular system, cell elements containing biologically active substances, and a mass of gap connections (fig. 1.2). At palpation at the zone of the skin over an acupoint, it is possible to find a minor excavation, fosse or loosening of subcutaneous fat and muscles. At deeper palpation in the AP zone, usually there are morbid indications.

Thus an acupoint is a complex functional unit, which provides interaction between the internal body and the environment.

M. Teppone

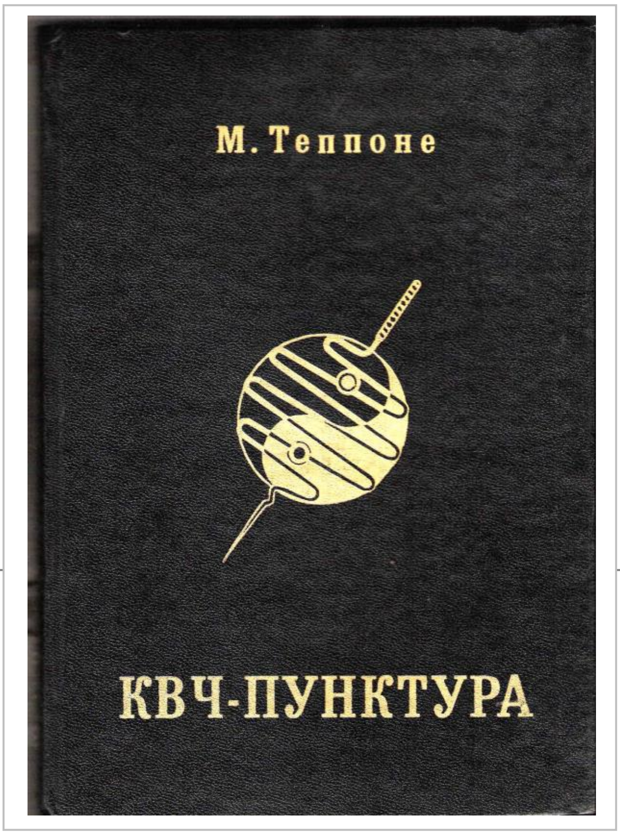
Extremely High Frequency (EHF)-Puncture

Moscow, 1997, 315 p. illustr (Rus); ISBN: 5-7333-0392-1
https://archive.org/details/TepponeMikhail.ExtremelyHighFrequencyehfPuncture1997

М.В.Теппоне

КВЧ - ПУНКТУРА

(крайне высокочастотная пунктура)



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Теппоне М.В.
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Книга содержит краткий обзор истории КВЧ-терапии; некоторые аспекты физических и биологических эффектов низкоинтенсивного электромагнитного излучения миллиметрового диапазона; гипотезы, объясняющие эффекты КВЧ-воздействия и сравнение различных методик КВЧ-терапии.

Основную часть книги составляет описание КВЧ-пунктуры с обоснованием необходимости индивидуализации зоны/точки воздействия. Подробное изложение теории традиционной китайской медицины позволяет осуществлять эффективный выбор точек акупунктуры при лечении различных заболеваний.

Книга рассчитана на иглотерапевтов, физиотерапевтов и врачей, использующих КВЧ-терапию и лазеро-пунктуру.

Теppone M.
T 34 ***EHF-Puncture.*** — Moscow.: «Logos», «Coloyaro», 1997. — 314 p., illustrations.

This book contains a brief review of the history of EHF-Therapy; some aspects of the physical and biological effects of low intensity millimeter band electromagnetic radiation, hypotheses explaining the effects of EHF exposure and a comparison of various methods of EHF-Therapy.

The main part of the book contains a description of EHF-Puncture and provides the rational for the necessity to individualize zones/points of exposure. Various theories of traditional Chinese acupuncture are presented which permit an effective selection of acupoints to be accomplished during the treatment of different diseases.

This book is intended for acupuncturists, physiotherapeutists and doctors using EHF-Therapy and laser-puncture.

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DEFINITION OF PANDEMIC ON THE **WHO** WEBSITE

a collection
of articles, documents, news, and remarks
on the history of changing the definition of a
pandemic on the WHO website

Hidden Stories

2023

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Disclaimers

This Collection was compiled by Dr. Mikhail Teppone.

It was prepared in the course of research on Swine Flu Pandemic that was declared in 2009.

The need for this collection is due to the fact that many web pages with the information related to the history of the 'Definition of Pandemic on the WHO website' have been removed from the original sites and were preserved only in the web archive or on a third party websites.

The Collection has been prepared for research and education purposes to encourage further studies related to influenza pandemics that have occurred in the XXI century.

The Collection includes information that was found in the public domain only.

The Compiler declares there is no conflict of interests or any financial interest.

2023 – M. Teppone.

Definition of Pandemic on the WHO website: A Collection of articles, documents, news, and remarks on the history of changing the definition of a pandemic on the WHO website. – *Hidden Stories*, Malaysia, July, 2023, pp. 160. DOI: 10.13140/RG.2.2.11046.29760/1

TWO VIRUSES
IN
ONE VACCINE

a collection
of articles, documents, news, and remarks
on the history of the vaccine against seasonal flu
which contained live avian flu viruses

Hidden Stories

2023

M. Teppone.

Two Viruses in One Vaccine: A Collection of articles, documents, news, and remarks on the history of the vaccine against seasonal flu which contained live avian flu viruses. – *Hidden Stories*, Malaysia, March-July, 2023, 381 pages. DOI: 10.13140/RG.2.2.14169.60009/2

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https://archive.org/details/collection-bird-fluvirus-vaccine

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This Collection was compiled by Dr. Mikhail Teppone.

It was prepared in the course of research on Swine Flu Pandemic which was declared in 2009.

The need for this collection is due to the fact that many web pages with the information related to the history of the 'Bird Flu Pandemic' and Swine Flu Pandemic, as well as a flu vaccine contaminated with the bird flu virus have been removed from the original sites and were preserved only in the web archive or on a third party websites.

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COVID-19

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УДК 614.2

Teppone M.

THE DEFINITION OF PANDEMIC: CAUSES AND CONSEQUENCES OF ITS ADJUSTMENT IN 2009 AND 2011

Bionion Sdn Bhd. № 1, Jalan Sungai Jeluh 32/192, Shah Alam, 40460, Selangor, Malaysia

The article considers results of the study evaluating historical and epidemiological events that preceded and accompanied adjustment of the pandemic description on the WHO website in 2009 and 2011.
The analysis covered publications related to epidemics and pandemics issues, the WHO documents, the WHO website.
The descriptions of pandemic mostly focused on "enormous numbers of cases and deaths". Since May 2009, new description of pandemic was published, focusing on disease prevalence. In 2011 it reverted to initial one with no comments. From perspective of the WHO document of 2009, declaration of swine flu pandemic in June 2009 seemed justified. However, considering previous pandemic history, common sense and consequences of declaring pandemic of disease with low both number of cases and mortality, it was premature move.
Since primary factor hindering development of pandemic is effectiveness of infectious disease treatment, to minimize likelihood of new pandemic it is necessary to improve special medical education quality and to study and to adapt to modern conditions all effective medications and methods used in the past.

Keywords: pandemic; epidemic; swine flu; the WHO; H1N1.

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For correspondence: Teppone M., the Medical Director, Medical Department, Bionion Sdn Bhd. № 1, Shah Alam, Selangor, Malaysia. e-mail: mikhail.teppone@gmail.com

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> "For years, the organization's web site defined an influenza pandemic as causing 'enormous numbers of deaths and illness.' But the agency recently pulled the definition, apologizing for causing confusion and anxiety."
>
> (*The New York Times*, 8 June 2009)

Introduction

Infectious diseases, as well as epidemics, have been well-known since ancient times. The Chinese Yellow Emperor's Inner Canon, believed to date from the tenth century BC, describes external pathogens that can cause acute infectious diseases which affect many people simultaneously [1]. At that time, doctors knew that the course of a disease in each case depended on the patient's initial state and his "defense energy" (Wei Qi) [2]. By "defense energy," one can mean a complex response of the immune and other body systems involved in the pathogenetic and sanogenetic reactions of the patient.

Despite the variety of external pathogens represented by thousands of viruses and bacteria, the human body has a limited set of protective reactions known in modern pathophysiology as inflammation, fever, hypoxia, general adaptation syndrome, and others. These pathogenetic syndromes are accompanied by nonspecific symptoms, such as fever, weakness, chills or feeling hot, headache, cough, shortness of breath, nausea, vomiting, diarrhea, skin rash, discoloration of the skin, and so on, which have similar pathogenesis, regardless of the causative agent of the infectious disease.

With all the variety of pathogens, in the case of the development of any febrile disease, only two main mechanisms are involved that lead to an increase in temperature — an increase in heat production or a decrease in heat transfer [3]. Similarly, 2–3 mechanisms are involved in forming each clinical syndrome.

About 1800 years ago, Dr. Zhang Zhongjing studied the results of previous generations of research and developed a theory of acute infectious diseases that explained the diagnosis and treatment of leading syndromes. According to this theory, in the case of the development of an acute infectious process, there is a change in six phases of the disease, reflecting the gradual inclusion of various levels of protection. Each phase can proceed according to one of two or three options. Thus, the variety of clinical syndromes associated with acute infectious diseases can be reduced to ten or twelve options, each of which a protocol of etiopathogenetic treatment has been developed [4]. When symptoms change and, accordingly, when the clinical syndrome changes, a new treatment must be selected. Therefore, in treating one patient, the protocol for the use of drugs was constantly changed following changes in the main symptoms of the disease. This phenomenon could explain failed clinical trials conducted by modern scientists unfamiliar with phases of an infectious disease.

There are some examples of treatment of the initial phases of infectious diseases: in the case of initial fever with general cold feelings without sweating — *Herba Ephedrae* was recommended; if there is initial fever with general hot feelings — *Folium Mori Albae* or *Herba Menthae Haplocalycis* should be used; if there is initial fever with intensive sweating or tension in the muscles — *Ramulus Cinnamomi Cassiae* was recommended; in the case of fever with alternating cold and hot feelings — *Radix Bupleuri*, was used, and so on. A change in symptoms pointed to a change in the phase of the disease and required an adjustment of therapy. If a patient has a severe fever with hemorrhagic symptoms, skin rashes, kidney and liver impairment, delirium, and other symptoms of aggravation of the disease — *Radix of Isatis tinctoria* should be applied [5]. In the succeeding centuries, protocols for treating infectious diseases were updated following a new understanding of the etiology and pathogenesis of diseases and advances in pharmacology.

A modern physician who has studied Hans Selye's General Adaptation Syndrome [6] is only familiar with a limited version of Dr. Zhang's theory of acute infectious diseases and needs more knowledge to apply it at the patient's bedside.

It can be assumed that the development of an epidemic or pandemic depends not so much on the danger of an external pathogen but on the knowledge and experience of the doctor and on his ability to choose an individual treatment corresponding to the current phase of the acute disease. Therefore, training a doctor who knows how to use effective means and methods of treatment should be the basis for a successful fight against future pandemics. Otherwise, we are in for a series of pandemics reminiscent of those that occurred in 2009–2010 and 2020–2023, when the main hope was placed on quarantine, movement restrictions, and mass vaccination.

Materials and methods

Since the cause of the change of the description of a pandemic on the WHO website in 2009 and 2011 is not clear, analyses of the literature related to the epidemics and pandemics, WHO documents, WHO website, and articles published in journals and the Internet pages have been done. This study aims to reveal the main historical and epidemiological events that preceded and accompanied the adjustment of the description of a pandemic on the WHO website in 2009 and 2011.

To optimize this study, pages of the WHO website dedicated to the description of a pandemic were collected in a thematic digest containing text and page screenshots [7].

Results

A brief overview of the pre-1999 definition of a pandemic

In a dictionary published in London in 1791, the term epidemic (*epidemius*) refers to a disease that affects many people simultaneously and then disappears. In the same dictionary, the word pandemic (*pandemius*) is explained as a synonym for the word epidemic [8].

In a dictionary published in Philadelphia in 1874, there is an explanation, that the term 'Epidemic' (*Epidemius*) derived from the Greek words — ἐπί (epi), meaning “upon”, and δῆμος (dēmos), meaning “people” is applied to any disease which seems to be upon the entire population of a country at one time [9]. A term 'Pandemia' also derived from Greek words — παν (pan), that means “all” or “everything”, and δῆμος (dēmos), that means “people”. This term refers to the disease which affects the people of a country generally [10].

At the end of the 20th century, the term “epidemic” took on a broader meaning and began to be applied to an unusual increase in the number of cases of a particular disease, both infectious and non-infectious. The term “pandemic” is used to describe an epidemic affecting a very high proportion of the population of a significant geographic region but “customarily restricted to diseases such as cholera, plague, and influenza” [11, 12].

The discussion of the contradictions between the necessity and legitimacy of using the term “pandemic” began in early May 2009 [13], i.e., about a month before June 11, 2009, when the Director-General of the World Health Organization (WHO), Dr. Margaret Chan, stated: “*The world is now at the start of the 2009 influenza pandemic*” [14].

Definition of the “pandemic” in the WHO documents published in 1999–2017

In 1999, the WHO issued a document, the “Influenza Pandemic Preparedness Plan”. It referred to influenza pandemics that occurred in 1918, 1957, and 1968 and provided a detailed description of the phases of pandemic development, including the Inter-Pandemic phase, the Preparedness phase (three levels), and the Pandemic period (four phases), after which the Post-Pandemic period, that is the same as the Inter-Pandemic one began again [15].

The 1999 document did not define what a pandemic was but clarified that “A pandemic will be declared when the new virus sub-type has been shown to cause several outbreaks in at least one country, and to have spread to other countries, with consistent disease patterns indicating that serious morbidity and mortality is likely in at least one segment of the population” [15]. Thus, the criterion for the onset of a pandemic was *serious morbidity and mortality*.

Due to the emergence of sporadic cases of avian influenza a new document was issued in 2004, where the following description of the emergence of a pandemic was given: “An influenza pandemic occurs with the appearance of a new influenza virus against which none of the population has any immunity. This results in several simultaneous epidemics worldwide with *enormous numbers of cases and deaths*. With the increase in global transport and communications, as well as urbanization and overcrowded conditions, epidemics resulting from a new influenza virus are likely to be established quickly around the world” [16]. Thus, the main pandemic criterion as *enormous numbers of cases and deaths* remained unchanged.

The following are the descriptions of the pandemic presented in the WHO documents in subsequent years, suggesting that the characteristics of the pandemic have remained the same. For example, "Influenza pandemics are associated with *high morbidity, excess mortality*, and social and economic disruption" (January 2005). [17] "Influenza pandemics (worldwide epidemics) have occurred at irregular and unpredictable intervals, and have been associated with *substantial morbidity, mortality* and economic cost" (March 2005) [18]. "An influenza pandemic (or global epidemic) occurs when a new influenza virus subtype appears, against which no one is immune. This may result in several simultaneous epidemics worldwide with *high numbers of cases and deaths*. With the increase in global transport and urbanization, epidemics caused by the new influenza virus are likely to occur rapidly around the world." (Spring 2005) [19]. "Influenza pandemics (worldwide epidemics) … have been associated with *substantial morbidity, mortality* and economic cost (October 2005) [20]. In addition, documents of the WHO emphasized that the pandemic virus may lead to several simultaneous epidemics worldwide, resulting in *high numbers of cases and deaths* [18], or *considerable morbidity and mortality* [21].

In March 2005, the WHO prepared one more document — "WHO Global Influenza Preparedness Plan" [22] which, like the previous documents, stated that the pandemic virus could cause significant *morbidity and mortality* in all age groups. This new document mentioned the 1918, 1957, and 1968 influenza pandemics, which claimed millions of lives. It also provided a detailed description of six phases of the development of a pandemic, all of which were characterized by an increased and sustained transmission in the general population.

The first objective for the WHO leadership during a pandemic (phase 6) was "to minimize morbidity and mortality" associated with current human infections [22]. Thus the pandemic was still characterized by *high morbidity and mortality*; otherwise, there would be no reason to lower these parameters.

The development of the following WHO document — "Pandemic Influenza Preparedness and Response," was completed in the spring of 2009. According to a 'Google search,' the new edition was published on April 26, 2009 [23], on the very next day after the first meeting of the Emergency Committee convened by the WHO Director-General to address the swine flu outbreak [24].

Like the previous analog document, published in 2005, the new one mentioned the 1918, 1957, and 1968 influenza pandemics, which claimed millions of lives; however, the occurrence of the word 'mortality' or 'death' in the new document has decreased by half. The new document retained the six-phase structure. The Phase 6 (the pandemic phase) was characterized "by community level outbreaks in at least one other country in a different WHO region in addition to the criteria defined in Phase 5" [23].

There was no definition of a pandemic; various pandemic phases differ only in the prevalence of infection without considering the severity of the course of the disease and mortality. According to the new document, WHO did not commit "*to minimize morbidity and mortality*," as it was in the document issued in 2005. This document was used as a guide to declare the swine flu pandemic on June 11, 2009.

In the document issued by the WHO in 2017 — "Guidelines on Regulatory Preparedness for provision of marketing authorization of human pandemic influenza vaccines in non-vaccine-producing countries," it was mentioned that a pandemic could cause several simultaneous epidemics worldwide with *high numbers of cases of clinical disease and deaths* [25].

Definition of the term "pandemic" on the WHO website before May 4, 2009

In 2003–2005, the section on infectious diseases was entitled "Communicable Disease Surveillance & Response." In October 2005, this page was renamed "Epidemic and Pandemic Alert and Response." On July 10, 2009, the WHO website dedicated to infectious diseases was named "Global Alert and Response" [7].

The first description of a pandemic, available on the WHO website, dates back to February 2, 2003. In particular, it says: "An influenza pandemic occurs when a new influenza virus appears against which the human population has no immunity, resulting in several, simultaneous epidemics worldwide with *enormous numbers of deaths and illness*". Further: "With the increase in global transport and communications, as well as urbanization and overcrowded conditions, epidemics due the new influenza virus are likely to quickly take hold around the world" [7]. This description was similar to that which appeared in the WHO document published in 2005 [19].

In the second half of June 2004, an addendum appeared on the WHO website: "Outbreaks of influenza in animals, especially when happening simultaneously with annual outbreaks in humans, increase the chances of a pandemic, through the merging of animal and human influenza viruses. During the last few years, the world has faced several threats with pandemic potential, making the occurrence of the next pandemic just a matter of time" [7].

In October 2008, minor changes were made on the WHO website: "An influenza pandemic occurs when a new influenza virus appears against which the human population has no immunity, resulting in epidemics worldwide with enormous numbers of deaths and illness". This definition of a pandemic remained on the WHO website until May 4, 2009 [7].

The historical and epidemiological events that preceded the adjustment of the description of a pandemic on the WHO website in May 2009

For several years, commencing in 2003, scientists in many countries have warned about the possible beginning of an avian influenza pandemic. Under the 1999 Pandemic Preparedness Plan, the WHO initiated the research necessary to produce a new vaccine rapidly. However, after a small peak in deaths in 2006, they began to decline in subsequent years, and by the end of 2008, it was clear that the threat of an avian influenza pandemic had subsided [26].

Despite declining demand for an avian influenza vaccine, development and production continued. In January 2009, the Austrian pharmaceutical company Baxter sent containers with a "vaccine" against influenza (H3N2) to biological laboratories in Germany, the Czech Republic, and Slovenia. It was soon discovered that the "vaccine" contained live avian influenza (H5N1) virus. At first, a Baxter spokesman said that the vaccine was contaminated accidentally. However, he later admitted that "experimental viral material" was sent instead of vaccines, which was not noticed in the accompanying documents. By the beginning of April 2009, the discussion of the spread of the contaminated vaccine had reached the international level. On April 8, 2009, a lawsuit was filed against the Austrian branch of Baxter and against AVIR Green Hills Biotechnology [27].

On April 17, 2009, the Center for Disease Control and Prevention (CDC) determined that two cases of febrile respiratory illness in southern California were infected with a swine influenza A (H1N1) virus [28]. On April 23, 2009, Dr. Anne Schuchat (Director of CDC's National Center for Influenza and Respiratory Diseases), reported about five new cases and informed that the causative agent of the new disease was a reassortant virus consisting of the genes of four strains of influenza, namely North American swine, North American avian, Eurasian swine, and human seasonal [29]. On April 24, 2009, Richard Besser, acting director of the CDC, declared that a swine flu epidemic had begun in Mexico and the United States [30].

On April 25, 2009, the first meeting of the Emergency Committee convened by the Director-General of WHO took place [24]. Two days later, after the second meeting of the Committee, the pandemic influenza alert level was raised from Phase 3 to Phase 4 [31]. On April 29, 2009, WHO Director Dr. Chang stated: "Based on assessment of all available information, and following several expert consultations, I have decided to raise the current level of influenza pandemic alert from phase 4 to phase 5." She also urged all governments to activate their pandemic preparedness plans and be on "high alert for unusual outbreaks of influenza-like illness and severe pneumonia" [32].

However, on April 30, 2009, Mexican officials said the swine flu epidemic was stable for several days. Of the 168 deaths attributed to swine flu, only 12 have been confirmed [33]. On May 3, 2009, the Mexican Health Minister, Jose Angel Cordova, said the swine flu virus peaked between April 23 and 28, and the evolution of an epidemic began to decline. He also assumed businesses would return to regular activity during the week and schools would be opened for studies [34].

On May 4, 2009, Dr. R. Besser announced a change in reporting of morbidity, which should now include confirmed and probable cases of the infection with the 2009 H1N1 virus [35]. On the same day, during a press conference held by WHO staff, a CNN reporter expressed doubt about a possible pandemic announcement and pointed out that on the WHO website, the flu pandemic was characterized by "enormous numbers of deaths and illness". To this remark, WHO's public relations representative, Natalie Boudou, replied, "It was a mistake, and we apologize for the confusion. The definition was put up a while ago and paints a rather bleak picture and could be very scary" [13]. On the evening of May 4, the definition of a pandemic disappeared from the WHO website [7], and a new definition appeared on May 6, 2009. It read as follows: "What is an influenza pandemic? A disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. An influenza pandemic may occur when a new influenza virus appears against which the human population has no immunity. With the increase in global transport, as well as urbanization and overcrowded conditions in some areas, epidemics due to a new influenza virus are likely to take hold around the world, and become a pandemic faster than before. WHO has defined the phases of a pandemic to provide a global framework to aid countries in pandemic preparedness and response planning. Pandemics can be either mild or severe in the illness and death they cause, and the severity of a pandemic can change over the course of that pandemic" [7].

On June 11, 2009, WHO Director Dr. Margaret Chan stated: "…I have conferred with leading influenza experts, virologists, and public health officials. In line with procedures set out in the International Health Regulations, I have sought guidance and advice from an Emergency Committee established for this purpose. On the basis of available evidence, and these expert assessments of the evidence, the scientific criteria for an influenza pandemic have been met. I have therefore decided to raise the level of influenza pandemic alert from phase 5 to phase 6. The world is now at the start of the 2009 influenza pandemic" [14].

In mid-July 2009, the WHO representative stated: "This pandemic has been characterized, to date, by the mildness of symptoms in the overwhelming majority of patients, who usually recover, even without medical treatment, within a week of the onset of symptoms". Therefore it was recommended to stop testing for the swine flu virus [36].

The historical and epidemiological events that preceded the adjustment of the description of a pandemic on the WHO website in 2011

The increase in the pandemic phase to the sixth level was accompanied by the intensification of anti-pandemic measures. Most government officials and doctors around the world followed the recommendations of the WHO, in connection with which mass production and purchase of antiviral drugs and vaccines began. At the same time, some scientists and journalists believed that the pandemic announcement lacked common sense because mortality from the new virus did not exceed the seasonal influenza statistics [37, 38].

Besides, there were criticisms from professionals and officials. In particular, on November 5, 2009, Polish Minister of Health, Dr. Ewa Kopacz, speaking at a meeting of the Polish Parliament, said that the new disease is not more dangerous than seasonal flu, and before starting to purchase vaccines, it is necessary to study the results of clinical trials, the list of ingredients, and reports on side effects which had not been provided. She also noted that vaccine manufacturers should be held responsible for side effects [39].

The most severe blow to the "pandemic" was the statement of journalists who found signs of financial interest in WHO experts when declaring a pandemic [40].

At the end of January 2010, the Parliamentary Assembly of the Council of Europe (PACE) adopted a resolution to investigate the influence of pharmaceutical companies on the global swine flu campaign, focusing on the extent of the pharmaceutical industry's influence on the WHO [41].

On June 24, 2010, PACE approved the conclusions of its Health Committee. According to the Assembly, the actions of the WHO, the health institutions of the European Union, and national Governments have led to unjustified concerns about the health risks faced by Europeans during the swine flu pandemic and the wastage of large sums of public money. The adopted resolution states that there was irrefutable evidence that WHO staff overestimated the severity of the pandemic, which led to a distortion of public health priorities. Paul Flynn, a speaker from the UK, reported on identifying severe shortcomings in the transparency of decision-making about the pandemic outbreak, which raised concerns about the influence of the pharmaceutical industry on decisions made. He also noted that the WHO wanted to deny making changes to the definition of a pandemic and revising the forecast of further development of the pandemic. Flynn also urged the media to avoid sensationalizing and staring up panic in public health [42].

On August 10, 2010, WHO Director-General Dr. Margaret Chan announced that the H1N1 influenza pandemic was over, and the post-pandemic period had begun [43].

The new description of a pandemic on the WHO website had been in place for a little more than two years. In 2011, between July 8 and August 7, the WHO website reverted to the description of a pandemic that was prior to May 4, 2009, namely: "An influenza pandemic occurs when a new influenza virus appears against which the human population has no immunity, resulting in epidemics worldwide *with enormous numbers of deaths and illness*". This description was on the WHO website until September 2011. Subsequent WHO influenza pandemic pages are not available [7].

Discussion

A comparison of the WHO documents and pages on the WHO website published in different years revealed fundamental differences in the description of a pandemic.

In the WHO document issued in 1999, there was an explanation that the characteristic attributes of a pandemic were *high morbidity and mortality* [15]. In 2005, when leading epidemiologists predicted the imminent start of an avian influenza pandemic, the emphasis that a pandemic virus could cause an epidemic with high morbidity and mortality was retained. Therefore, the first objective of WHO during a pandemic was to unite the efforts of the health systems of various countries *to minimize morbidity and mortality* [22].

In the WHO document published in the spring of 2009, the emphasis on high morbidity and mortality associated with a pandemic virus and pandemic was removed [23], in connection with which there was no need for a unifying effort by WHO *to minimize morbidity and mortality*.

On the WHO website, the description of a pandemic familiar to many, such as the "*enormous numbers of deaths and illness*," had been present for over six years [7]. With a slight change in wording but without change in meaning, it was used by the governments of Canada, the United States, the United Kingdom, and other officials who prepared documents dealing with the pandemic in 2004–2008 [44–46].

Nevertheless, during a press conference held on May 4, 2009, Natalie Boudou, a WHO communications officer, said that the definition of a pandemic, which included "*enormous numbers of deaths and illness*," was wrong and would be corrected [13]. Sometime later, another WHO representative, Gregory Hartl, stated that the definition of a pandemic with *enormous numbers of deaths and illness* was posted on the website in 2004, however, it was not official, so the Pandemic Preparedness Guide should be read [47].

In the following months, changing the definition of a pandemic was discussed many times, but WHO staff insisted that there was no change in the definition of a pandemic [42]. Actually, it was true since WHO has never formally defined pandemic influenza either in the WHO documents or on the WHO websites [48]. However, in mid-summer 2011, the description of a pandemic on the WHO website reverted to its original definition with *enormous numbers of deaths and illness* [7].

Conclusion

The concept of epidemics caused by external pathogens has been known for many centuries. The term "pandemic" appeared later than "epidemic" and could have several meanings. It was used as a synonym for an epidemic, or to describe an epidemic that covered a vast territory, or to indicate an epidemic of an infectious disease accompanied by high mortality, like a pandemic of plague, smallpox, or cholera. In the 20th, the term "pandemic" began to be used with severe influenza epidemics and non-communicable diseases that increased mortality in most countries.

From the formal perspective of the WHO document issued in 2009, the declaration of a swine flu pandemic in June 2009 seemed justified. However, taking into account the previous history, common sense, and the consequences of declaring a pandemic for a disease not accompanied by a high number of cases and high mortality, it was a somewhat premature move, which was reflected in the resolution of the Health Committee of the Parliamentary Assembly of the Council of Europe.

Despite the achievements of modern medicine, in less than a quarter of the 21st century, humanity managed to survive two pandemics that could not have happened. From a practitioner's point of view, the difference between a pandemic, an epidemic, and one infectious disease case is irrelevant. A knowledgeable and experienced physician will not focus on the name of the virus or its strain since, in each case, individual pathogenesis-based treatment is used, considering the leading clinical syndrome.

To minimize the likelihood of a new pandemic studying and implementing all effective medicines and methods from ancient times to the present is necessary. Medical Universities should include Dr. Zhan's universal theory of acute infectious diseases in the curriculum. According to this theory, the progression of any viral infectious disease is accompanied by a succession of specific clinical syndromes, reflecting the inclusion of various phases of the pathogenesis of the infectious process. Assessing the patient's complaints is sufficient to use this theory in practice. The development of modern drugs, used in the past according to Dr. Zhan's theory, will effectively treat any new infectious disease without waiting for the results of clinical trials.

Thus, by improving the quality of the university education and postgraduate medical specialization, the problem of successful treatment of new infectious diseases can be solved, and future epidemics and pandemics be prevented.

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Mikhail Teppone

Definition of a Pandemic: the causes and consequences of its adjustment in 2009 and 2011

Bionion Sdn Bhd. N 1, Jalan Sungai Jeluh 32/192, Shah Alam, 40460, Selangor, Malaysia
Tel: + 603 5879 7707; Fax: + 603 5879 7705; e-mail: mikhail.teppone@gmail.com
Teppone M. https://orcid.org/0000-0002-5366-3188

> "For years, the organization's web site defined an influenza pandemic
> as causing 'enormous numbers of deaths and illness.'
> But the agency recently pulled the definition,
> apologizing for causing confusion and anxiety."
> [*The New York Times*, 8 June 2009]

Abstract

The study was carried out to evaluate historical and epidemiological events that preceded and accompanied the adjustment of the description of a pandemic on the WHO website in 2009 and 2011.

Since the cause of the change in the description of a pandemic on the WHO website is not clear, analyses of the literature related to the epidemics and pandemics, WHO documents, WHO website, and articles published in journals and the Internet have been done.

Until early May 2009, the description of the pandemic focused on "enormous numbers of cases and deaths." On May 6, 2009, a new description of the pandemic was published, focusing on the prevalence of the disease; in 2011 it reverted to the initial one without any comments. From the perspective of the WHO document issued in 2009, the declaration of a swine flu pandemic in June 2009 seemed justified. However, considering the previous pandemic history, common sense, and the consequences of declaring a pandemic for a disease not accompanied by a high number of cases and high mortality, it was a premature move.

Since the primary factor hindering the development of a pandemic is the effectiveness of treating infectious disease, to minimize the likelihood of a new pandemic, it is necessary to improve the quality of special medical education and to study and adapt to modern conditions all effective drugs and methods used in the past.

Key words: pandemic, epidemic, swine flu, WHO, H1N1

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1. Background

An analysis of WHO website pages dedicated to influenza pandemics revealed changes in the use of the term "pandemic" between 2009 and 2011. Some changes were reflected in WHO documents and the media, while others went unnoticed.

The purpose of this study is to identify the historical and epidemiological events that preceded and accompanied changes in the WHO website's definition of a pandemic.

2. Materials and methods

Since the cause of the change of the description of a pandemic on the WHO website in 2009 and 2011 is not clear, analyses of the literature related to the epidemics and pandemics, WHO documents, WHO website, and articles published in journals and the Internet pages have been done.

To optimize this study, pages of the WHO website dedicated to the description of a pandemic were collected in a thematic digest containing text and page screenshots.[1]

3. Introduction

Infectious diseases, as well as epidemics, have been well-known since ancient times. The Chinese *Canon of the Internal*, believed to date from the tenth century BC, describes external pathogens that can cause acute illness and affect large numbers of people at once. A forecast regarding the occurrence of such diseases could be made by observing the weather in the first days of the Chinese New Year.[2]

At that time, doctors knew that the course of a disease in each case depended on the patient's initial state and his "defense energy" (Wei Qi).[3] By "defense energy," one can mean a complex response of the immune and other body systems involved in the pathogenetic and sanogenetic reactions of the patient.

Despite the variety of external pathogens represented by thousands of viruses and bacteria, the human body has a limited set of protective reactions known in modern pathophysiology as inflammation, fever, hypoxia, general adaptation syndrome, and others. These pathogenetic syndromes are accompanied by nonspecific symptoms, such as fever, weakness, chills or feeling hot, headache, cough, shortness of breath, nausea, vomiting, diarrhea, skin rash, discoloration of the skin, and so on, which have similar pathogenesis, regardless of the causative agent of the infectious disease.

With all the variety of pathogens, in the case of the development of any febrile disease, only two main mechanisms are involved that lead to an increase in temperature – an increase in heat production or a decrease in heat transfer.[4] Similarly, 2-3 mechanisms are involved in forming each clinical syndrome.

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About 1800 years ago, Dr. *Zhang Zhongjing* studied the results of previous generations of research and developed a theory of acute infectious diseases that explained the diagnosis and treatment of leading syndromes. According to this theory, in the case of the development of an acute infectious process, there is a change in six phases of the disease, reflecting the gradual inclusion of various levels of protection. Each phase can proceed according to one of two or three options. Thus, the variety of clinical syndromes associated with acute infectious diseases can be reduced to ten or twelve options, each of which a protocol of etiopathogenetic treatment has been developed. When symptoms change and, accordingly, when the clinical syndrome changes, a new treatment must be selected. Therefore, in treating one patient, the protocol for the use of drugs was constantly changed following changes in the main symptoms of the disease.[5] (fig. 1) This phenomenon could explain failed clinical trials conducted by modern scientists unfamiliar with phases of an infectious disease.

There are some examples of treatment of the initial phases of infectious diseases: in the case of initial fever with general cold feelings without sweating – *Herba Ephedrae* was recommended; if there is initial fever with general hot feelings – *Folium Mori Albae* or *Herba Menthae Haplocalycis* should be used; if there is initial fever with intensive sweating or tension in the muscles – *RamulusCinnamomiCassiae* was recommended; in the case of fever with alternating cold and hot feelings – *Radix Bupleuri*, was used, and so on. A change in symptoms pointed to a change in the phase of the disease and required an adjustment of therapy. If a patient has a severe fever with hemorrhagic symptoms, skin rashes, kidney and liver impairment, delirium, and other symptoms of aggravation of the disease – *Radix of Isatis tinctoria* should be applied.[6]

That famous research by Dr. *Zhang* was finalized in a book called *Shang Han Lun*, or *Treatise on Febrile Diseases Caused by Cold*. Now it is available in European languages.[5]

In the succeeding centuries, protocols for treating infectious diseases were updated following a new understanding of the etiology and pathogenesis of diseases and advances in pharmacology.

1.	*Tai Yang*	Common cold symptoms
2.	*Shao Yang*	Unstable phase
3.	*Yang Ming*	Progressive fever
4.	*Tai Yin*	Beginning of exhaustion
5.	*Shao Yin*	High fever, hemorrhagic and other Complications
6.	*Jue Yin*	

Figure 1. Six phases of acute infectious diseases evolution.

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A modern physician who has studied Hans Selye's General Adaptation Syndrome[7] is only familiar with a limited version of Dr. Zhang's theory of acute infectious diseases and needs more knowledge to apply it at the patient's bedside.

It can be assumed that the development of an epidemic or pandemic depends not so much on the danger of an external pathogen but on the doctor's knowledge and experience and on his ability to choose an individual treatment corresponding to the current phase of the acute disease.

Therefore, training a doctor who knows how to use effective means and treatment methods should be the basis for a successful fight against future pandemics.

Without the necessary focus on training doctors in effective treatment methods, we face a series of pandemics akin to those of 2009-2010 and 2020-2023. Those awful times were marked by a heavy reliance on quarantine, movement restrictions, and mass vaccination. Nowadays, this threat is becoming extremely real, as the notion of new pathogens, both laboratory-derived and natural, symbolized by X, is gaining traction.

4. A brief overview of the pre-1999 definition of a pandemic

In a dictionary published in London in 1791, the term epidemic (*epidemius*) refers to a disease that affects many people simultaneously and then disappears. In the same dictionary, the word pandemic (*pandemius*) is explained as a synonym for the word epidemic.[8]

In a dictionary published in Philadelphia in 1874, there is an explanation, that the term 'Epidemic' (*Epidemius*) derived from the Greek words – ἐπί (epi), meaning "upon", and – δῆμος (dēmos), meaning "people" is applied to any disease which seems to be upon the entire population of a country at one time.[9] A term 'Pandemia' also derived from Greek words – παν (pan), that means "all" or "everything", and – δῆμος (dēmos), that means "people". This term refers to the disease which affects the people of a country generally.[10]

At the end of the 20th century, the term "epidemic" took on a broader meaning and began to be applied to an unusual increase in the number of cases of a particular disease, both infectious and non-infectious. The term "pandemic" is used to describe an epidemic affecting a very high proportion of the population of a significant geographic region but "customarily restricted to diseases such as cholera, plague, and influenza".[11,12]

The discussion of the contradictions between the necessity and legitimacy of using the term "pandemic" began in early May 2009,[13] i.e., about a month before June 11, 2009, when the Director-General of the World Health Organization (WHO), Dr. Margaret Chan, stated: "*The world is now at the start of the 2009 influenza pandemic*".[14]

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5. Definition of the "pandemic" in the WHO documents published in 1999-2017

In 1999, the WHO issued a document, the *Influenza Pandemic Preparedness Plan*. It referred to influenza pandemics that occurred in 1918, 1957, and 1968 and provided a detailed description of the phases of pandemic development, including the Inter-Pandemic phase, the Preparedness phase (three levels), and the Pandemic period (four phases), after which the Post-Pandemic period, that is the same as the Inter-Pandemic one began again.[15]

The 1999 document did not define what a pandemic was but clarified that "A pandemic will be declared when the new virus sub-type has been shown to cause several outbreaks in at least one country, and to have spread to other countries, with consistent disease patterns indicating that serious morbidity and mortality is likely in at least one segment of the population".[15] Thus, the criterion for the onset of a pandemic was *serious morbidity and mortality*.

Due to the emergence of sporadic cases of avian influenza a new document was issued in 2004, where the following description of the emergence of a pandemic was given: "An influenza pandemic occurs with the appearance of a new influenza virus against which none of the population has any immunity. This results in several simultaneous epidemics worldwide with *enormous numbers of cases and deaths*. With the increase in global transport and communications, as well as urbanization and overcrowded conditions, epidemics resulting from a new influenza virus are likely to be established quickly around the world".[16] Thus, the main pandemic criterion as *enormous numbers of cases and deaths* remained unchanged.

The following are the descriptions of the pandemic presented in the WHO documents in subsequent years, suggesting that the characteristics of the pandemic have remained the same. For example, "Influenza pandemics are associated with *high morbidity, excess mortality*, and social and economic disruption" (January 2005).[17] "Influenza pandemics (worldwide epidemics) have occurred at irregular and unpredictable intervals, and have been associated with *substantial morbidity, mortality* and economic cost" (March 2005).[18] "An influenza pandemic (or global epidemic) occurs when a new influenza virus subtype appears, against which no one is immune. This may result in several simultaneous epidemics worldwide with *high numbers of cases and deaths*. With the increase in global transport and urbanization, epidemics caused by the new influenza virus are likely to occur rapidly around the world." (Spring 2005).[19] (fig. 2) "Influenza pandemics (worldwide epidemics) ... have been associated with *substantial morbidity, mortality* and economic cost (October 2005).[20] In addition, documents of the WHO emphasized that the pandemic virus may lead to several simultaneous epidemics worldwide, resulting in *high numbers of cases and deaths*,[18] or *considerable morbidity and mortality*.[21]

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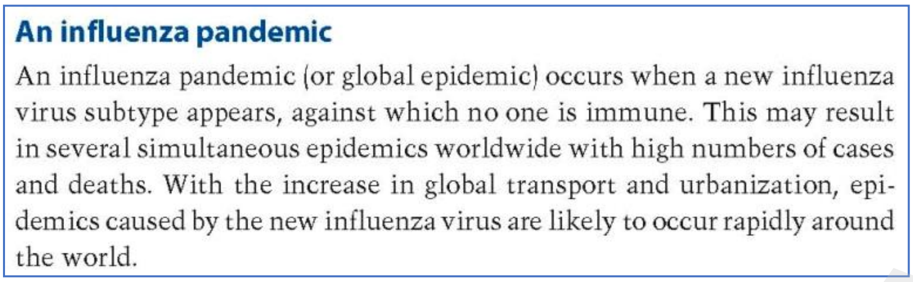


An influenza pandemic

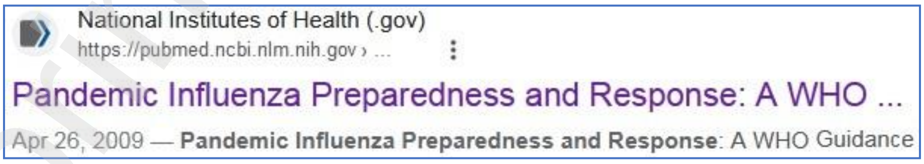
An influenza pandemic (or global epidemic) occurs when a new influenza virus subtype appears, against which no one is immune. This may result in several simultaneous epidemics worldwide with high numbers of cases and deaths. With the increase in global transport and urbanization, epidemics caused by the new influenza virus are likely to occur rapidly around the world.

Figure 2. WHO checklist for influenza pandemic. preparedness planning. – WHO, 2005, p. vi.[19]

In March 2005, the WHO prepared one more document – *WHO Global Influenza Preparedness Plan*,[22] which, like the previous documents, stated that the pandemic virus could cause significant *morbidity and mortality* in all age groups. This new document mentioned the 1918, 1957, and 1968 influenza pandemics, which claimed millions of lives. It also provided a detailed description of six phases of the development of a pandemic, all of which were characterized by an increased and sustained transmission in the general population.

The first objective for the WHO leadership during a pandemic (phase 6) was "to minimize morbidity and mortality" associated with current human infections.[22] Thus the pandemic was still characterized by *high morbidity and mortality*; otherwise, there would be no reason to lower these parameters.

The development of the following WHO document – *Pandemic Influenza Preparedness and Response*, was completed in the spring of 2009. According to a 'Google search,' the new edition was published on April 26, 2009,[23] on the very next day after the first meeting of the Emergency Committee convened by the WHO Director-General to address the swine flu outbreak.[24] (fig. 3)



National Institutes of Health (.gov)
https://pubmed.ncbi.nlm.nih.gov › ...

Pandemic Influenza Preparedness and Response: A WHO ...

Apr 26, 2009 — **Pandemic Influenza Preparedness and Response**: A WHO Guidance

Figure 3. Pandemic Influenza Preparedness and Response. – WHO, April 26, 2009.[23]

When conducting a new search during the preparation of the latest version of this study (20.05.24), it was mentioned that a new edition of the *Pandemic Influenza Preparedness and Response*, was published on March 3, 2009 (fig. 4).

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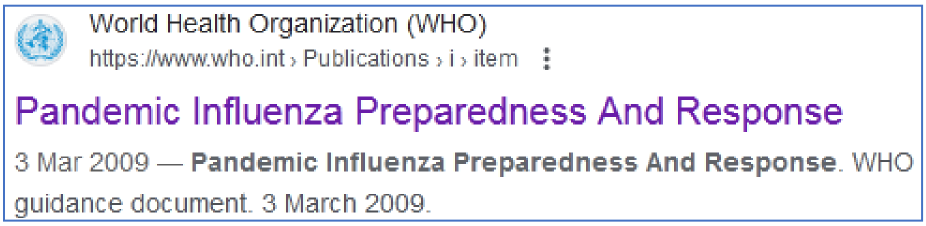
World Health Organization (WHO)
https://www.who.int › Publications › i › item

Pandemic Influenza Preparedness And Response

3 Mar 2009 — **Pandemic Influenza Preparedness And Response**. WHO guidance document. 3 March 2009.

Figure 4. Pandemic Influenza Preparedness and Response. – WHO, March 3, 2009.

Like the previous analog document, published in 2005, the new one mentioned the 1918, 1957, and 1968 influenza pandemics, which claimed millions of lives; however, the occurrence of the word 'mortality' or 'death' in the new document has decreased by half. The new document retained the six-phase structure. The Phase 6 (the pandemic phase) was characterized "by community level outbreaks in at least one other country in a different WHO region in addition to the criteria defined in Phase 5".[23]

There was no definition of a pandemic; various pandemic phases differ only in the prevalence of infection without considering the severity of the course of the disease and mortality. According to the new document, WHO did not commit "*to minimize morbidity and mortality*," as it was in the document issued in 2005. This document was used as a guide to declare the swine flu pandemic on June 11, 2009.

In the document issued by the WHO in 2017 – *Guidelines on Regulatory Preparedness* for provision of marketing authorization of human pandemic influenza vaccines in non-vaccine-producing countries, it was mentioned that a pandemic could cause several simultaneous epidemics worldwide with *high numbers of cases of clinical disease and deaths*.[25]

6. Definition of the term "pandemic" on the WHO website before May 4, 2009

In 2003-2005, the section on infectious diseases was entitled *Communicable Disease Surveillance & Response*.[26] In October 2005, this page was renamed *Epidemic and Pandemic Alert and Response*.[27] On July 10, 2009, the WHO website dedicated to infectious diseases was named *Global Alert and Response*.[28]

The first description of a pandemic, available on the WHO website, dates back to February 2, 2003. In particular, it says: "An influenza pandemic occurs when a new influenza virus appears against which the human population has no immunity, resulting in several, simultaneous epidemics worldwide with *enormous numbers of deaths and illness*."

Further: "With the increase in global transport and communications, as well as urbanization and overcrowded conditions, epidemics due the new influenza virus are likely to quickly take

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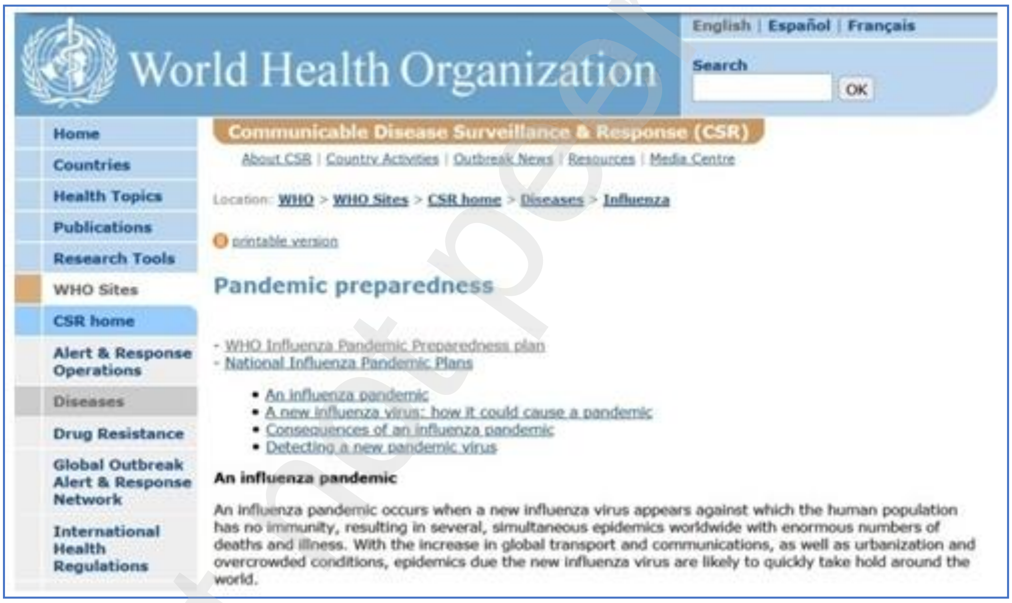
hold around the world" (fig. 5).[26] This description was similar to that which appeared in the WHO document published in 2005.[19]

In the second half of June 2004, an addendum appeared on the WHO website: "Outbreaks of influenza in animals, especially when happening simultaneously with annual outbreaks in humans, increase the chances of a pandemic, through the merging of animal and human influenza viruses. During the last few years, the world has faced several threats with pandemic potential, making the occurrence of the next pandemic just a matter of time".[29]

In October 2008, minor changes were made on the WHO website: "An influenza pandemic occurs when a new influenza virus appears against which the human population has no immunity, resulting in epidemics worldwide with enormous numbers of deaths and illness".[30] This definition of a pandemic remained on the WHO website until May 4, 2009.[31]


World Health Organization
English | Español | Français
Search
OK
Communicable Disease Surveillance & Response (CSR)
About CSR | Country Activities | Outbreak News | Resources | Media Centre
Location: WHO > WHO Sites > CSR home > Diseases > Influenza
printable version
Home
Countries
Health Topics
Publications
Research Tools
WHO Sites
CSR home
Alert & Response Operations
Diseases
Drug Resistance
Global Outbreak Alert & Response Network
International Health Regulations

Pandemic preparedness

- WHO Influenza Pandemic Preparedness plan
- National Influenza Pandemic Plans

- An influenza pandemic
- A new influenza virus: how it could cause a pandemic
- Consequences of an influenza pandemic
- Detecting a new pandemic virus

An influenza pandemic

An influenza pandemic occurs when a new influenza virus appears against which the human population has no immunity, resulting in several, simultaneous epidemics worldwide with enormous numbers of deaths and illness. With the increase in global transport and communications, as well as urbanization and overcrowded conditions, epidemics due the new influenza virus are likely to quickly take hold around the world.

Figure 5. Pandemic Influenza Preparedness and Response.[26]

7. The historical and epidemiological events that preceded the adjustment of the description of a pandemic on the WHO website in May 2009

For several years, commencing in 2003, scientists in many countries have warned about the possible beginning of an avian influenza pandemic. Under the 1999 Pandemic Preparedness Plan, the WHO initiated the research necessary to produce a new vaccine rapidly. However, after a small peak in deaths in 2006, they began to decline in subsequent years, and by the end of 2008, it was clear that the threat of an avian influenza pandemic had subsided.[32]

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Despite declining demand for an avian influenza vaccine, its development and production continued. In January 2009, the Austrian pharmaceutical company Baxter sent containers with a "vaccine" against influenza (H3N2) to biological laboratories in Germany, the Czech Republic, and Slovenia. It was soon discovered that the "vaccine" contained live avian influenza (H5N1) virus. At first, a Baxter spokesman said that the vaccine was contaminated accidentally. However, he later admitted that "experimental viral material" was sent instead of vaccines, which was not noticed in the accompanying documents. By the beginning of April 2009, the discussion of the spread of the contaminated vaccine had reached the international level. On April 8, 2009, a lawsuit was filed against the Austrian branch of Baxter and against AVIR Green Hills Biotechnology.[33]

On April 17, 2009, the Center for Disease Control and Prevention (CDC) determined that two cases of febrile respiratory illness in southern California were infected with a swine influenza A (H1N1) virus.[34] On April 23, 2009, Dr. Anne Schuchat (Director of CDC's National Center for Influenza and Respiratory Diseases), reported about five new cases and informed that the causative agent of the new disease was a reassortant virus consisting of the genes of four strains of influenza, namely North American swine, North American avian, Eurasian swine, and human seasonal.[35] On April 24, 2009, Richard Besser, acting director of the CDC, declared that a swine flu epidemic had begun in Mexico and the United States.[36]

On April 25, 2009, the first meeting of the Emergency Committee convened by the Director-General of WHO took place.[24] Two days later, after the second meeting of the Committee, the pandemic influenza alert level was raised from Phase 3 to Phase 4.[37] On April 29, 2009, WHO Director Dr. Chang stated: "Based on assessment of all available information, and following several expert consultations, I have decided to raise the current level of influenza pandemic alert from phase 4 to phase 5." She also urged all governments to activate their pandemic preparedness plans and be on "high alert for unusual outbreaks of influenza-like illness and severe pneumonia".[38]

However, on April 30, 2009, Mexican officials said the swine flu epidemic was stable for several days. Of the 168 deaths attributed to swine flu, only 12 have been confirmed.[39] On May 3, 2009, the Mexican Health Minister, Jose Angel Cordova, said the swine flu virus peaked between April 23 and 28, and the evolution of an epidemic began to decline. He also assumed businesses would return to regular activity during the week and schools would be opened for studies.[40]

On May 4, 2009, Dr. R. Besser announced a change in reporting of morbidity, which should now include confirmed and probable cases of the infection with the 2009 H1N1 virus.[41]

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On the same day, during a press conference held by WHO staff, a CNN reporter expressed doubt about a possible pandemic announcement and pointed out that on the WHO website, the flu pandemic was characterized by "enormous numbers of deaths and illness." To this remark, WHO's public relations representative, Natalie Boudou, replied, "*It was a mistake, and we apologize for the confusion. The definition was put up a while ago and paints a rather bleak picture and could be very scary*".[13] On the evening of May 4, the definition of a pandemic disappeared from the WHO website,[42] and a new definition appeared on May 6, 2009. It read as follows:"What is an influenza pandemic? A disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. An influenza pandemic may occur when a new influenza virus appears against which the human population has no immunity. With the increase in global transport, as well as urbanization and overcrowded conditions in some areas, epidemics due to a new influenza virus are likely to take hold around the world, and become a pandemic faster than before. WHO has defined the phases of a pandemic to provide a global framework to aid countries in pandemic preparedness and response planning. Pandemics can be either mild or severe in the illness and death they cause, and the severity of a pandemic can change over the course of that pandemic".[43]

On June 11, 2009, WHO Director Dr. Margaret Chan stated: "... I have conferred with leading influenza experts, virologists, and public health officials. In line with procedures set out in the International Health Regulations, I have sought guidance and advice from an Emergency Committee established for this purpose. On the basis of available evidence, and these expert assessments of the evidence, the scientific criteria for an influenza pandemic have been met. I have therefore decided to raise the level of influenza pandemic alert from phase 5 to phase 6. The world is now at the start of the 2009 influenza pandemic".[14]

In mid-July 2009, the WHO representative stated: "This pandemic has been characterized, to date, by the mildness of symptoms in the overwhelming majority of patients, who usually recover, even without medical treatment, within a week of the onset of symptoms." Therefore it was recommended to stop testing for the swine flu virus.[44]

8 The historical and epidemiological events that preceded the adjustment of the description of a pandemic on the WHO website in 2011

The increase in the pandemic phase to the sixth level was accompanied by the intensification of anti-pandemic measures. Most government officials and doctors around the world followed the recommendations of the WHO, in connection with which mass production and purchase of antiviral drugs and vaccines began.

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At the same time, some scientists and journalists believed that the pandemic announcement lacked common sense because mortality from the new virus did not exceed the seasonal influenza statistics.[45,46]

Besides, there were justified criticisms from professionals and officials. In particular, on November 5, 2009, Polish Minister of Health, Dr. Ewa Kopacz, speaking at a meeting of the Polish Parliament, said that the new disease is not more dangerous than seasonal flu, and before starting to purchase vaccines, it is necessary to study the results of clinical trials, the list of ingredients, and reports on side effects which had not been provided. She also noted that vaccine manufacturers should be held responsible for all side effects.[47]

Following standard requirements for obtaining approval to use vaccines and a negative attitude towards the use of vaccines that have not passed the necessary tests and clinical trials were supported by the Deputy Minister of Health of Poland – Adam Fronczak,[48] as well as the Prime Minister of Poland – Donald Tusk.[49]

The most dramatic blow to the "pandemic" was the statement of Danish journalists who found signs of financial interest in WHO experts when declaring a pandemic.[50]

On January 29, 2010, the Parliamentary Assembly of the Council of Europe (PACE) adopted a resolution to investigate the influence of pharmaceutical companies on the global swine flu campaign, focusing on the extent of the pharmaceutical industry's influence on the WHO.[51]

On June 24, 2010, PACE approved the conclusions of its Social, Health and Family Affairs Committee. According to the Assembly, the actions of the WHO, the health institutions of the European Union, and national Governments have led to unjustified concerns about the health risks faced by Europeans during the swine flu pandemic and the wastage of large sums of public money. The adopted resolution states that there was irrefutable evidence that WHO staff overestimated the severity of the pandemic, which led to a distortion of public health priorities. Paul Flynn, a speaker from the UK, reported on identifying severe shortcomings in the transparency of decision-making about the pandemic outbreak, which raised concerns about the influence of the pharmaceutical industry on decisions made. He also noted that the WHO wanted to deny making changes to the definition of a pandemic and revising the forecast of further development of the pandemic. Flynn also urged the media to avoid sensationalizing and staring up panic in public health.[52-53]

On August 10, 2010, WHO Director-General Dr. Margaret Chan announced that the H1N1 influenza pandemic was over, and the post-pandemic period had begun.[54] By this time, at least 350 million people had received the vaccine.[55] Adverse reactions after vaccination against the H1N1 virus have been observed for several years.[56-57]

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By mid-March 2011, a group of independent experts found that accusations of corruption against WHO management were unsubstantiated since WHO employees acted within the law, based on the available objective data.[58] At the end of March 2011, the head of the experts, Dr. Harvey Fineberg delivered a vindication speech at the office of the World Health Organization.[59] In a response speech, WHO Director Margaret Chan thanked the members of the experts for appreciating the efforts of WHO staff during the swine flu pandemic.[60] On May 17, 2011, Columbia University awarded Dr. Harvey W. Feinberg its highest honor in public health, the Frank A. Calderone Prize.[61]

The new description of a pandemic on the WHO website had been in place for a little more than two years. In 2011, between July 8 and August 7,[62-63] the WHO website reverted to the description of a pandemic that was prior to May 4, 2009, namely: "An influenza pandemic occurs when a new influenza virus appears against which the human population has no immunity, resulting in epidemics worldwide *with enormous numbers of deaths and illness*." This description was on the WHO website until September 2011.[64]

Subsequent WHO pages on influenza pandemics are not accessible.[65] In some cases, the explanation was: "*The page or file you are trying to access was not found*. This is because the web address was incorrect or the file had been moved or deleted. We migrated web content to a new platform in 2020, so some old content may no longer be available".[66]

Most WHO website pages relating to events before 2012 are currently unavailable. Small number of pages devoted to the infectious diseases and pandemics have been found on the archive website (https://web.archive.org/web/),[67] but the number of available pages is gradually decreasing. To maintain the possibility of further research on the swine flu pandemic, the collected web pages were systematized and published.[1,33,100-102]

9. Discussion

A comparison of the WHO documents and pages on the WHO website published in different years revealed fundamental differences in the description of a pandemic.

In the WHO document issued in 1999, there was an explanation that the characteristic attributes of a pandemic were *high morbidity and mortality*.[15] In 2005, when leading epidemiologists predicted the imminent start of an avian influenza pandemic, the emphasis that a pandemic virus could cause an epidemic with high morbidity and mortality was retained. Therefore, the first objective of WHO during a pandemic was to unite the efforts of the health systems of various countries *to minimize morbidity and mortality*.[22]

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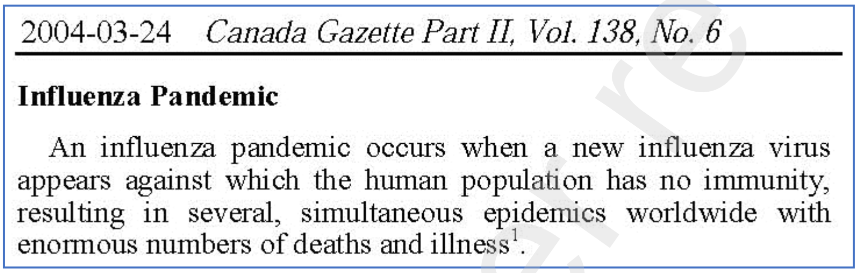
In the WHO document published in the spring of 2009, the emphasis on high morbidity and mortality associated with a pandemic virus and pandemic was removed,[23] in connection with which there was no need for a unifying effort by WHO *to minimize morbidity and mortality*.

On the WHO website, the description of a pandemic familiar to many, such as the "*enormous numbers of deaths and illness*," had been present for over six years.[26,64] With a slight change in wording but without change in meaning, it was used by the governments of Canada, (fig. 6) the United States, the United Kingdom, (fig. 7) and other officials who prepared documents dealing with the pandemic in 2003-2008.[68-71]



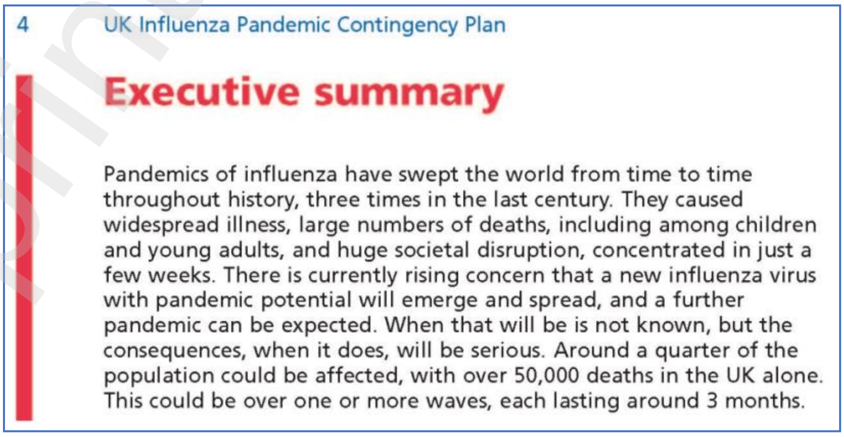
2004-03-24 *Canada Gazette Part II, Vol. 138, No. 6*

Influenza Pandemic

An influenza pandemic occurs when a new influenza virus appears against which the human population has no immunity, resulting in several, simultaneous epidemics worldwide with enormous numbers of deaths and illness[1].

Figure 6. Quarantine Act. – Canada Gazette 2004; Mar 24, 138(6): 113.[68]

Nevertheless, during a press conference held on May 4, 2009, Natalie Boudou, a WHO communications officer, said that the definition of a pandemic, which included "*enormous numbers of deaths and illness*," was wrong and would be corrected.[13] Sometime later, another WHO representative, Gregory Hartl, stated that the definition of a pandemic with *enormous numbers of deaths and illness* was posted on the website in 2004, however, it was not official, so the Pandemic Preparedness Guide should be read.[72]



4 UK Influenza Pandemic Contingency Plan

Executive summary

Pandemics of influenza have swept the world from time to time throughout history, three times in the last century. They caused widespread illness, large numbers of deaths, including among children and young adults, and huge societal disruption, concentrated in just a few weeks. There is currently rising concern that a new influenza virus with pandemic potential will emerge and spread, and a further pandemic can be expected. When that will be is not known, but the consequences, when it does, will be serious. Around a quarter of the population could be affected, with over 50,000 deaths in the UK alone. This could be over one or more waves, each lasting around 3 months.

Figure 7. Pandemic Flu: UK Influenza Pandemic Contingency Plan. – London, 20 Oct 2005, p. 4.[69]

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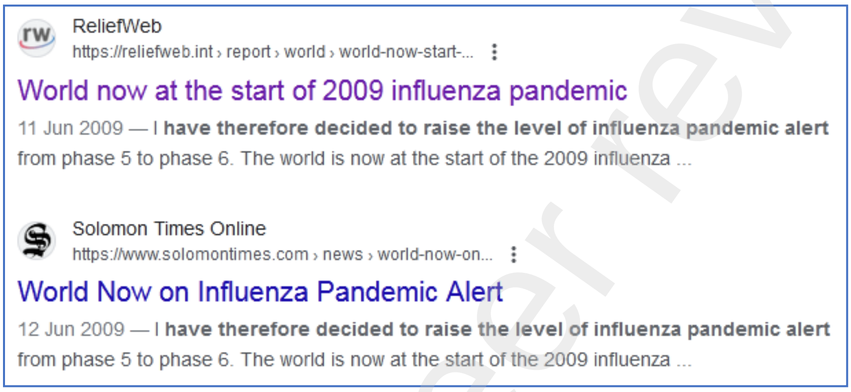
Remarks

One cannot believe that the definition of a pandemic on the WHO website from February 2003 to May 2009 was incorrect, especially given the changes to the text that were made in 2004, 2005, and 2008.

Besides that, Hartl's statement that the WHO website does not reflect the official position of the World Health Organization raises additional questions for this organization. For example, currently, there is no published document confirming that the Director General of the WHO has raised the influenza pandemic alert level from Phase 5 to Phase 6. A Google search (2009-2011) revealed only two web links, dated June 11 and 12, 2009,[73] which do not belong to the WHO and are not directly associated with the WHO. (Fig. 8) Does it mean that all documents disappeared or did not exist?



ReliefWeb
https://reliefweb.int › report › world › world-now-start-...

World now at the start of 2009 influenza pandemic

11 Jun 2009 — I **have therefore decided to raise the level of influenza pandemic alert** from phase 5 to phase 6. The world is now at the start of the 2009 influenza ...

Solomon Times Online
https://www.solomontimes.com › news › world-now-on...

World Now on Influenza Pandemic Alert

12 Jun 2009 — I **have therefore decided to raise the level of influenza pandemic alert** from phase 5 to phase 6. The world is now at the start of the 2009 influenza ...

Figure 8. "I have therefore decided to raise the level of influenza pandemic alert from phase 5 to phase 6"

A similar incident occurred on March 11, 2020, when the WHO Director's thoughts on the pandemic expressed during his briefing[74] were perceived as prompting local decision-making. However, no official WHO documents reflecting the collective decision made by WHO experts have been published so far.

To understand the statements of N. Budu and G. Hartl in 2009 and the reasoning of T. Ghebreyesus in 2020, one should listen to the speech of the WHO Director at the World Government Summit (February 12, 2024). In particular, he said: "Let me be clear: *WHO did not impose anything on anyone* during the COVID-19 pandemic. Not lockdowns, not mask mandates, not vaccine mandates… Our job is to support governments with evidence-based guidance, advice and, when needed, supplies, to help them protect their people. But the decisions are theirs".[75] Thus, *only local legislators* issued all documents related to both pandemics.

After the Paul Flynn report (June 4, 2010), the changes in the definition of a pandemic were discussed many times, but WHO staff insisted that it was not changed.[52] Actually, it was true since WHO has never formally defined pandemic influenza either in the WHO documents or on the WHO websites.[76] However, in mid-summer 2011, the description of a pandemic on the WHO website reverted to its original definition with *enormous numbers of deaths and illness*.[63]

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10. Conclusion

The concept of epidemics caused by external pathogens has been known for many centuries. The term "pandemic" appeared later than "epidemic" and could have several meanings. It was used as a synonym for an epidemic, or to describe an epidemic that covered a vast territory, or to indicate an epidemic of an infectious disease accompanied by high mortality, like a pandemic of plague, smallpox, or cholera. In the 20th century, the term "pandemic" began to be used with severe influenza epidemics and non-communicable diseases that increased mortality in most countries.

From the formal perspective of the WHO document issued in 2009, the declaration of a swine flu pandemic in June 2009 seemed justified. The main reason for the discussion around declaring a pandemic was that the description of the pandemic on the WHO website was changed too late, around a month before the pandemic was declared. However, taking into account the previous history, common sense, and the consequences of declaring a pandemic for a disease not accompanied by a high number of cases and high mortality, it was a somewhat premature move, which was reflected in the resolution of the Social, Health and Family Affairs Committee of the Parliamentary Assembly of the Council of Europe.

Although a detailed analysis of the historical and epidemiological events that preceded and accompanied changes in the WHO website's definition of a pandemic has been done, a reason for returning the definition to its original version in 2011 remains unclear.

Despite modern medicine's achievements and WHO's enhanced international role, nevertheless, a pandemic was declared twice in less than a quarter of the 21st century. That means that the main direction for the development of global health care was wrong. The correct and effective path of development is the absence of pandemics.

From a practitioner's point of view, the difference between a pandemic and an epidemic is irrelevant. A physician clearly understands that he treats a patient, not a virus. Therefore, a knowledgeable and experienced physician does not focus on the name of the virus or its strain since, in each case, individual pathogenesis-based treatment is used, considering the leading clinical syndrome..

To minimize the likelihood of a new pandemic studying and implementing all effective medicines and methods from ancient times to the present is necessary. Medical Universities should include Dr. Zhan's universal theory of acute infectious diseases in the curriculum. According to this theory, the progression of any viral infectious disease is accompanied by a succession of specific clinical syndromes, reflecting the inclusion of various phases of the pathogenesis of the infectious process. Assessing the patient's complaints is sufficient to use

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this theory in practice. The development of modern drugs, used in the past according to Dr. Zhan's theory, will effectively treat any new infectious disease without waiting for the results of clinical trials.

Thus, by improving the quality of the university education and postgraduate medical specialization, the problem of successful treatment of new infectious diseases can be solved, and future epidemics and pandemics be prevented.

11. Chronology of the events

This study has revealed the following sequence of the significant historical and epidemiological events that preceded and accompanied changes in the definition of a pandemic on the WHO website in 2009 and 2011:

2003-2009: Increasing, but then decreasing in probability of an Avian Flu pandemic.[32]

2004-2009: Development and production of vaccines against a virtual pandemic strain of the Avian Flu virus.[77]

2009, January: The Austrian company Baxter delivered "vaccines" against seasonal flu which contained live deadly Avian Flu virus.[33]

April 8: A lawsuit was filed with the Vienna City Prosecutor's Office against the Austrian branch of Baxter and Avir Green Hills Biotechnology.[78]

April 14: CDC: The American Centers for Disease Control and Prevention (CDC) announced the identification of the first case of a febrile illness in the United States caused by a new strain of swine flu.[34]

April 22: Cable News Network (CNN) reported the possible leaking of pathogens from a laboratory in Frederick, Maryland.[79]

April 23: CDC: Dr. Ann Schuchat reported that the causative agent of the new disease was a reassortant virus consisting of genes from four strains of influenza, namely North American swine, North American avian, Eurasian swine, and seasonal human.[35]

April 24: CDC: Dr. Richard Besser, acting director of the CDC, announced the beginning of the swine flu epidemic in Mexico and the United States.[36]

April 25: WHO: The first meeting of the Emergency Committee convened by the WHO Director-General took place.[24]

April 26: WHO: A new edition of the "Pandemic Influenza Preparedness and Response" was published on line.[23]

April 27: WHO: Influenza pandemic alert level raised from phase 3 to phase 4.[37]

April 28: Indonesian Health Minister suggests that the new virus is of artificial origin.[80]

April 29: WHO: Influenza pandemic alert level raised from phase 4 to phase 5.[38]

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May 2: Mexico's Health Minister said that the epidemic is declining, and the country will probably return to normal life next week.[40]

May 4: CDC: Dr. Richard Besser announced that the swine flu report must now include both confirmed and probable cases of infection with the 2009 H1N1 virus.[41]

May 4: WHO: During a press conference, a WHO representative, Nathalie Boudou, stated that the previous definition of the pandemic with the *enormous numbers of deaths and illnesses … was a mistake, and we apologize for the confusion*.[13]

May 4 (20:58): The definition of a pandemic has disappeared from the WHO website.[42]

May 5: The Chief State Sanitary Doctor of Russia, Gennady Onishchenko, in an interview with Echo of Moscow, stated that "WHO acts as the marketing department of the La Roche company".[81]

May 6 (00:51): A new definition of the pandemic has appeared on the WHO website.[43]

May 12: Experts say swine flu may result from human (laboratory) error.[82]

June 11: WHO: Pandemic influenza alert level raised from phase 5 to phase 6.[14]

June 18: An inventory of potentially deadly pathogens at Fort Detrick's infectious disease laboratory found more than 9,000 vials that had not been accounted for.[83]

June 30: Experts continue to claim that the swine flu virus is of artificial origin.[84]

July 16: WHO: Canceling testing for swine flu virus.[44]

May-October: Discussion and development of the first global vaccination project.[85-94]

September 2009: China first to vaccinate against novel H1N1 virus.[95]

October 24: US President Obama declared a national emergency in the United States due to the 2009 H1N1 influenza pandemic.[96]

November 5: Polish Minister of Health Ewa Kopacz, speaking at a meeting of the Polish parliament, said that the new disease is no more dangerous than seasonal flu. Vaccine manufacturers must provide a list of vaccine ingredients and clinical trial results.[47]

November 16: Danish journalists accused WHO employees of corrupt connections with vaccine manufacturers.[50]

November 25: The newspaper Novye Izvestia published an article "*Agents of Infusion*," which ended the propaganda about the Swine pandemic in Russia.[97]

December 18: Dr. Wolfgang Wodarg, Chairman of the Committee on Social Health and Family Affairs of the Parliamentary Assembly of the Council of Europe (PACE), and a group of parliamentarians introduced the topic for discussion: – "False pandemics - a threat to health"; Dr. V. Wodarg accused WHO employees of organizing a false pandemic and having corrupt connections with vaccine manufacturers.[98]

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2010, January 12: The topic "Fake pandemics – a threat to health" was planned for discussion at the plenary session of the PACE winter session.[99]

January 29, 2010: PACE adopted a resolution to investigate the influence of pharmaceutical companies on the global campaign against swine flu, paying particular attention to the degree of influence of the pharmaceutical industry on the WHO.[51]

June 4: In a report to members of the Committee on Social Health and Family Affairs, PACE, Paul Flynn reported the identification of severe shortcomings in the transparency of decision-making; ... He also noted that WHO does not want to acknowledge the fact that changes have been made to the definition of a pandemic, as well as to revise the forecast for the further development of the pandemic.[52]

June 24: PACE approved the conclusions of its Committee on Social Health and Family Affairs. The resolution said there was overwhelming evidence that WHO officials overestimated the severity of the pandemic, resulting in misrepresentation of public health priorities.[53]

August 10: WHO Director-General Dr Margaret Chan announced that the influenza pandemic caused by the H1N1 virus is over.[54]

2011, March: A group of new independent experts, which studied the actions of WHO employees before and during the swine flu pandemic, found the accusations of corruption against the WHO leadership unsubstantiated.[58]

March 28: The head of a group of the new independent experts, Dr. Harvey Fineberg, gave an acquittal speech at the office of the World Health Organization.[59]

March 28: WHO Director Margaret Chan thanked independent experts for appreciating the efforts of WHO staff during the swine flu pandemic.[60]

May 17: Columbia University awarded Dr. Harvey W. Feinberg its highest honor in public health, the Frank A. Calderon Award.[61]

2011, July-August: The WHO website returned to the original definition of a pandemic, emphasizing high morbidity and mortality.[63]

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The author declares that there is no conflict of interest in the submitted manuscript.

Special digests related to the Swine Flu pandemic have been prepared to collect facts and to identify cause-and-effect relationships between events presented above.[1,33,100-102]

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Organotherapy with placenta: past and present

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Mikhail Teppone
Bionion Sdn Bhd, N 1, Jalan Sungai Jeluh 32/192, Shah Alam, 40460, Selangor, Malaysia

Correspondence: Mikhail Teppone, Bionion Sdn Bhd, N 1, Jalan Sungai Jeluh 32/192, Shah Alam, 40460, Selangor, Malaysia, Email mikhail.teppone@gmail.com

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Abstract

For several millennia, doctors and healers used therapeutic ingredients extracted from minerals, plants, and animals. Among the active remedies derived from animals, the placenta was among the most popular ones. The use of placenta-based remedies has retained its significance in our time. The placenta-based therapeutics are indicated for stimulating immunity, wound healing, reduction of skin pigmentation, treatment of various patients suffering from gynecological disorders, etc.

By the beginning of the 21st century, the majority of specific functions and chemical ingredients of the placenta were identified and described. However, only now active proteins and peptides with molecular weight of about ten kDa were revealed. Presumably, they play an essential role during the therapeutic application of placental extract. Hopefully, this discovery will start a new era in the research and clinical application of organotherapeutic remedies, including placenta.

Keywords: organotherapy, placenta, peptides, nano-peptides, integrative medicine

Abbreviations: TCM, traditional chinese medicine; ATP, adenosine triphosphate; Da, Dalton; kDa, kilodalton; BCA protein assay, bicinchoninic acid protein assay; APR, AP revitalization; SDS-PAGE, Sodium dodecyl sulfate polyacrylamide gel electrophoresis; LCMS-MS, Liquid chromatography-mass spectrometry. S.A., Secundum Artem (According to Art, According to the Practice)

Introduction

During ancient times, doctors and healers used plants, minerals, and animal or human origin products for therapy, prevention of diseases, and to increase life expectancy. Raw or prepared materials and extracts derived from animal organs were applied singly or as part of complex remedies. In the 19th century, this type of therapeutics got the name 'Opotherapy' in French or 'Organotherapy' in English (1894).[1]

Placenta, as a part of Organotherapy, played an essential role during the history of folk and state healthcare. In the *History of Medicine*, Le Clerk mentioned that the human placenta had been used at least since Hippocrates. In particular, he provided a list of simple ingredients written in French, including *Aristoloche*, *Armoise*, *Aromates en général*, *Arrièrefais d'une femme*, *Arroches*, *Asne*, etc.[2] '*Arrière-fais*' in French means '*After-birth*' in English.[3] Unfortunately, there are no references to the book of Hippocrates, where the therapeutic application of the placenta was mentioned.

Terminology

Initially, the term "Placenta" meant a "Pie" or "Cake"

In ancient writings, the well-known term "Placenta" meant a "flat cake" made of wheat flour mixed with additional ingredients. In the *Illustrated Companion to the Latin Dictionary and Greek Lexicon*, Placenta (πλαχοῦς) is "A thin flat cake made of wheat flour, mixed with cheese and honey, but of considerable size, so that it would cut up into a number of separate pieces, for each of the guests present" (1849).[4]

In anatomy or medicine, the term "Secundinæ" was used instead of "Placenta"

In the old days, when they mentioned the placenta in the modern anatomical or physiological sense, they used the term – '*Secundine*,' '*Secundæ*' (pl), for example, in the book *Aristotle's compleat and experienc'd midwife*, edited by William Salmon, it is written: "Setting aside the name given to this by the Greeks and Latins, it is called in English by the name of Secundine, After-Birth, and After-Burden; which are held to be four in number. 1. The first is called Placentia, because it resembles the form of Cake ... 2. The second is Chorion: this skin, and that called the Amnion, involve the Child round both above and underneath ... 3. The third thing which makes up the Secundine is the Alantois, of which is a great dispute amongst Anatomists ... 4. The fourth and last covering of the Child is called Amnios ... (1700). [5] In a *New English-Latin Dictionary,* the 'after-birth' was translated as '*Secundinæ,*' '*Secundæ*' (pl), (1783).[6]

Anatomical and medical application of the term "Placenta" began in the 16th century

They began to use the term "Placenta" in books on anatomy or physiology in the 16th century. In the *Lessons on Antiques* (1516), an Italian philologist Luigi Richieri Rhodiginus, analyzed and explained various old terms. He gave examples when the term 'placenta' was used dealing with the various cakes, like *Sesamo Placenta est* {p. 240}; *pacto a Placenta* {241}; *Nam placenta crepidam* {710}. But in the chapter dealing with the terms relevant to the navel and umbilical cord, he used the word 'placentæ' as an anatomical term: "*Nã Epomphalium est quod Vmbilico incumbit, Mesophali uero sunt Placentæ quædã*" {413}.[7]

In the *Anatomy of Humane Bodies Epitomized* (1697), Thomas Gibson used several terms for placenta: "Upon the cutting open the Womb of a Woman with Child, the first thing that offers itself is the *Placenta uterina*, or Womb-cake, otherwise called *Hepar uterinum*, or Womb-liver, from the likeness of substance, and also use, according to those that imposed the name… It was an old tradition continued for many hundred years, that the Placenta adheres to the Womb by certain parts called *Cotyledones* or *Acetabula*.[8]

In the *Dictionary of Medical Science* (1874), there are examples of the terms used in the literature to mention Placenta or Secundine, in English: "Secundines, *Hystera, Deuter'ion, Metræ, Secundæ, Secundinæ, Afterbirth, Afterburden*. It means all that remains in the uterus after the birth of the child – viz., the placenta, a portion of the umbilical cord, and the membrane of the ovum. These are commonly

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not expelled till sometime after the birth of the fetus; hence their name".[3]

In Chinese language there are several terms that correspond to the placenta, including Zǐ hé chē (紫河车 / 紫河車), Zǐ hé zhī (紫河肢), Hòu rén (後人), Tāi yī (胎衣), Bāo yī (胞衣).[9] However, in some regions of China, the term Zǐ hé chē (紫河车 / 紫河車) may mean a herb *Paris Polyphylla* Fr.[10]

Thus, the terms used to refer to the placenta in an anatomical or physiological sense include, *in Chinese*: Zǐ hé chē (紫河车 / 紫河車), Zǐ hé zhī (紫河肢), Hòu rén (後人), Tāi yī (胎衣), Bāo yī (胞衣); *in English*: placenta, secundine, after-birth, after-burden, sugar-cake, placenta uteri, womb-cake; hepar uteri, womb-liver; *in French*: l'arrière-faix, carpelle, cotylédon, délivre, secundijne, secundyne; *in German*: die Nach-geburt, Wiseorax, Mutterkuchen, Nachgeburth; *in Greek*: πλακούντας, ύστερο; *in Latin*: secundas, secundinas, secundinæ, secundinarum, secundines, membrana partus (membrane delivery), placenta uteri, epar uterinum, etc.[5–11] In old books a long 's' letter [ſ] could be used instead of a standard 's', for example, *ſecundine*, *ſecundas*.[12]

The term "Placenta" in botany

The term "Placenta" (Placentas, or Placentae, pl) in botany means the surface of the carpel (highly modified leaf) to which the ovules (potential seeds) are attached. For better understanding this term in the Botany one can read the following excerpt: "When tomatoes were first cultivated in our gardens there was but one variety; this had a large, red, much wrinkled, and often irregular and misshapen fruit, with a thick outer wall, and a central placenta bearing the seeds surrounded by their pulp, and a considerable cavity or empty space between the two".[13]

Historical review of the medical application of the placenta

Medical application of the placenta in the first centuries of the first millennium AD

In the Ancient Encyclopedia known as the *Natural History* compiled by Pliny, the elder (*Caius Plinius Secundus*, AD 23-79) in the first century, several books were devoted to therapeutic remedies made from ingredients obtained from minerals, plants, animals, and human.[14] There are also recommendations on how to use she-ass placenta to prevent and treat epileptic seizures, plus sheep and goat placenta for treatment of female complaints and diseases. For example, "the membrane in which the kid (of goat) is enclosed in the uterus, dried and taken in wine, acts as an expellent upon the after-birth";[15] "for diseases incident to females, a ewe's placenta is very useful, as already mentioned by us, when speaking of goats".[16] Presumably, the oldest copy of the *Natural History* by Pliny available nowadays on the Internet, where the cited text could be found, was published in 1459.[17]

About three centuries after Pliny, the elder, Dr. Sextus Placitus wrote a book *Drugs derived from the animal kingdom*. In chapter 5 on Goats at the 29th note, Dr. Sextus Placitus recommended the usage of goat placenta with wine to expel the placenta.[18]

Therapeutic application of placenta in the XVI-XVIII centuries

Animal or human placentas were common remedies in medical practice during the Middle Ages and later. Dr. Varignana Guilielmo recommended using a prepared human placenta to expel stones from the kidney and urine bladder (1522).[19] Dr. Joseph Du Chesne applied extracts from the womb of a hare and human placenta to treat female infertility (1615).[20] In the book *Harvest of Innovative Medicine*, by Dr. Jean-Jacques Manget, it is written about application of cat and deer placentas, and also human placenta and umbilical cord (1683).[21]

During the 16th to 18th centuries, hundreds of books on internal medicine and pharmacology were published where the placenta was mentioned as a therapeutic remedy. One of the most comprehensive descriptions of the medical application of the placenta was found in the *Opera Omnia* or *The works of Johann Schrœder, Pierre Morell, and Daniel Ludwig* (1728). An author, Michael Ettmüller, collected information about therapeutic remedies from books of various famous predecessors.[22] The main symptoms requiring the use of placenta from various origins were female complaints and diseases, kidney and urine bladder stones, general weakness, epilepsy and melancholy, and also to stimulate libido and fertility, as anthelmintic medicine, and other diseases. Generally, the placenta was used after special preparation – it was soaked in wine, dried, and pulverized.

Therapeutic application of placenta in Traditional Chinese Medicine (TCM)

Presumably, the first mention of the use of the placenta for therapeutic purposes in Chinese medicine was in the book *Precious Prescriptions for Emergencies* (Bèi jí qiānjīn yào fāng) by Dr. Sun Simiao (孫思邈, 581-682). In the 15th volume devoted to eye diseases, Dr. Sun Simiao described the preparation of the eye wash medicine from a dried human placenta.[23]

The following famous book which included human placenta as a therapeutic remedy was *Gleanings from the Materia Medica* (Běncǎo Shíyí) by Dr. Chén Cáng-Qi (陳藏器, 687-757). He recommended a complex prescription that included powder of dried human placenta (紫河车) and various plants like *Phellodendron*, *Eucommia*, *Rehmannia*, *angelica sinensis*, etc. The main effect of this prescription is to invigorate Qi and nourish the blood.[24]

In the 16th century, various aspects of different medical remedies, including the human placenta, were described in *Compendium of Materia Medica* (Běncǎo gāngmù) by Dr. Li Shi Zhen (李時珍, 1518-1593).[25]

In the mid-19th century, several articles in European journals reported on TCM medicines, including information about human placenta application. One of the examples was a particular remedy that strengthened kidneys and testes: a mixture of extracts from stag horns, dog flesh, a species of fern, walnuts, and dried human placenta, etc.[26]

In 1902, a book on TCM published in Europe wrote: "*If a woman who delivered a baby had chlorose (anemia) she was prescribed a remedy from the dried placenta*."[27]

According to TCM view, the placenta has sweet and salty tastes and warm properties and enters channels of the Liver, Lung, and Kidney. The main effects of the placenta are to warm the Kidney yang, stimulate the Lung and Kidney qi, and nourish the blood and essence.[28]

Therapeutic application of placenta in the Middle East

In the book on Persian Pharmacology published in the Latin language in Europe, three complex prescriptions included camel placenta (1681).[29]

932. The prescription 'Lebovb Kebir' was designed by a Persian physician. This medicine included pistachios, acorns, walnuts,

asparagus seeds, peppermint herb, . . . and camel placenta. There were around fifty various ingredients in total. The effect of this medicine is to warm and strengthen the Kidneys and Stomach, increase fertility, strengthen muscles, etc.

994. The prescription 'Magi-Oun Foulad' was designed by an Indian physician and adapted to Persian medicine. Besides various herbal ingredients, it included camel placenta.

999. The prescription 'Magi-Oun Chovb Chini' was designed in China and adapted to Persian medicine by the local doctor. This medicine increased male power, supported the stomach, heart, and brain, and strengthened muscles. One of the ingredients was camel placenta.

Common recommendations from the Old Books

There were many medical books that recommended recipes that included the placenta of humans or various animals. Here are some of them, published in English:

The book "*Pharmacopœia Bateana*" (1694) by Doctor William Salmon included a section "XCIV. S*ecundinæ Preparatæ*, the Secundines or After-birth prepared" where it is written:

Bate.] R: *The Secundine of Woman*, *or of a Sow*, at *its time of bringing forth*; *wash it in White-wine*; *dry it as speedily as may be*, *and reduce it into a fine Pouder*, S.A. Dose is *ad* Ʒj. against the Falling-sickness and Suffocation of the Womb: it also facilitates the Birth in time of Travel, &c." *Salmon*.]

1. After it is washt in White Wine, it will be best to cut it into small pieces, for by that means it will the more easily dry, and be made fit to reduce into Pouder.
2. But that it might the more speedily be reduced, it will be best after the washing it with Wine, and drying it with Cloths, to wash it in the best rectified S.V. and then let it dry of its own accord, and being dried to dip it in again, and let it dry again, and this work to reiterate four or five times; for by this means the Fire, or Sulphur of the S.V. will more effectively dry it in one Day, than by the other it will be dried in a Week; and so it will be much more easily reduced to a Pouder.
3. The Author has shown you its Vertues, for which it is excellent, but the Dose is too small upon some occasions. It may be given *à Эij ad Ʒij*, in some proper Vehicle: But Note, the Afterburden of a Woman much exceeds, and is more Specific than that of a Beast (1694).[30]

"*The Receipts of the famous John Moncrief of Tippermalloch*" (1716) had the following prescription in the case of female infertility: *"Of Barrenness*. The After-Birth of a Woman is believed to be of great Efficacy, being dried and powdered, and taken to the quantity of a Dram".[31]

In 1762, Dr. Nicholas Culpeper recommended the human placenta in case of difficult childbirth: " … some prepare the Secundine thus: take the Navel-string and dry it in an Oven. Take two Drams of the Powder, Cinnamon, a Dram, Saffron, half a Scruple, with the juice of Savin, make Troches, give two Drams, or wash the Secundine in Wine, and bake it in a Pot, then wash in Endive-water and Wine, take half a Dram of it, Long-pepper, Galangal, each half a Dram, Plantain, and Endive-seed, each a Dram and half, Lavender-seed, four Ounces".[32]

Folk traditions regarding the placenta after childbirth

To this day, stories about the local traditions of various tribes have survived, according to which the human placenta had a symbolic or healing effect. For example, German traveler and naturalist Johann G. Gmelin visited the Siberian lands of the Russian Empire in 1733-1743 and reported that Jakut and Tungus people had a fascinating tradition. After the birth of a child, the placenta was given to the child's father, who, after cooking the placenta, invited friends and relatives to eat it together as a celebration of the new birth.[33]

There is also a folk prescription from the Caribbean nations: "Take the sun-dried placenta and soak it in water. Then, use the water to wash the eyes in the case of ophthalmic problems in children".[34]

Revival of therapeutic application of placenta in the early 20th century

As mentioned above, animal or human-origin placenta was quite popular among physicians before the end of the 18th century. However, in the 19th century, doctors suddenly fell silent and stopped discussing animal-origin medications, including human or animal placenta.

In 1889, Dr. C.-É. Brown-Séquard reported his trial on subcutaneous injections of a liquid obtained from the testicles of young dogs.[35] After this successful trial, animal-origin medications, called Organotherapy, were revived and used widely by classic medicine again.[36]

In April 1898, at the 4th French Congress on Internal Medicine (Montpellier), Dr. Henry Iscovesco reported on the successful use of the fresh ewe's placenta in the cases of chronic metritis.[37] In 1902, British Medical Journal published an article about a trial of Dr. Leon Bouchacourt, who used sheep placenta pills in treating 10 cases of metritis, uterine subinvolution, and as a galactagogue. The same article described placentophagia among animals and humans and the history of placenta application in classic medicine.[38] Shortly after these reports, various forms of therapeutics containing the placenta became popular among physicians again.[39]

Discovery of the endocrine function of the placenta

In ancient times, Aristotle (384-322 BC) and Hippocrates (460-357 BC) assumed that a fetus breathed and was nourished through the umbilical cord and placenta. Therefore, the placenta performed the functions both of the lung and intestine.[40]

Giovanni Battista Ercolani (1819-1883) was the first among 'modern doctors' who supposed that the placenta had an endocrine function. In his book, published in 1869, he described glandular structures of the placenta belonging to various animals.[41] A similar idea about the endocrine function of the placenta was later suggested by Dr. L. Nattan-Larrier (1900).[42] and Dr. Josef von Halban (1904).[43]

In 1913 the endocrine function of the placenta was proven with experiments conducted by Dr. B. Aschner. He injected ovarian and placental extracts into guinea pigs subcutaneously and observed stimulation of milk secretion, hyperemia of the genitalia, and haemorrhagia from the uterus of the guinea pigs. Placental extract generated a more impactful response in the guinea pig's body than extract prepared from the ovary.[44]

Therapeutic application of Placenta as a part of Organotherapy

Organotherapy is a treatment of disease using medicines prepared from the organs of the lower animals, chiefly the ox and the sheep.[45] Placenta was one of the ingredients used in Organotherapy.[39] Usually, the placenta of sheep or cows was used in a form of powder, tablets, or liquid extracts.

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Main indications for placental Organotherapy in the 20th century

The main therapeutic indications of placental Organotherapy were agalactia, pernicious vomiting during pregnancy, weakness after labor, and prevention of atrophy of the uterine walls after ovariectomy. Combining the placenta with mammary and pituitary glands was a common strategy.[46]

In the book *Treatise on Organotherapy and Pluriglandular therapy* (1921), there is a brief description of the placental product:

Source and Parts Used: The placenta of sheep and cows is chiefly used. One part of the desiccated parenchyma of the placenta represents about six parts of the fresh gland.

Therapeutic Indication: Extract of the parenchyma of the placenta is used to cause an increase in the production of milk.

This product has given satisfaction in the treatment of fibroma and carcinoma of the uterus, menorrhagia, dysmenorrhea, enlarged and sensitive uterus. It is recommended to prevent atrophy of the generative organs after ovariotomy, chronic metritis and infections after labor. *Synergistics*. Mammary gland, pituitary total. *Dose*. Three to nine grains, four times per day, between meals. Tablets of three grains".[47]

A book on internal secretion *The Endocrines* (1921), contains many cases of successful application of animal-origin therapeutics, including extract of placenta.[48] The author of the book, Dr. Samuel W. Bandler, explained the application of organ-specific extracts based on the physiological relation between the uterus, ovary, placenta, and pituitary gland. In the case of premenstrual syndrome and small fibroid in the uterus, he used extracts of placenta and thyroid,[49] and in the case of fibroids of the uteri, he used extracts of placenta, thyroid, and ovary.[50]

Subsequently, the placental extract was used in cases of various diseases, such as psoriasis,[51] rheumatoid arthritis,[52] multiple sclerosis,[53] chronic fatigue syndrome,[54] etc.

From the modern analysis of more than 3,500 publications dealing with the therapeutic application of placental extracts, all works could be divided into six groups:

- 36 % - stimulating or balancing immunity;
- 33 % - application for wound healing;
- 10 % - neurotrophic effect;
- 8 % - normalization of the skin pigmentation;
- 8 % - hepatoprotective effect;
- 5 % - using placental extracts in gynecological patients and obstetrics groups.[54]

Immuno-stimulating and anti-tumor effects of placenta

The immuno-stimulating effect has been reported in most studies (36%). The initial experiments in this field were carried out at the beginning of the 20th century.

In 1908-1909, Dr. G. Fichera used a product obtained by hydrolysis of the human placenta and fœtus and reported the disappearance or reduction in the size of malignant tumors in the patient.[56] Dr. S. Higuchi demonstrated in experiments on animals a high degree of immunity induced by treatment with mouse placenta, a lower degree of immunity with mouse blood, and an absence of immunity after treatment with other rat tissues (1913).[57] Drs. J. O. W. Barratt and A. J. Gelaire discovered in the experiments regression of implanted carcinoma after injection of pulped mouse fœtus and placenta (1913).[58] Dr. S. Itami reported the results of his research dealing with mesodermal derivatives to immunize mice against transplantable tumors. He proved that a whole embryo of a mouse, mouse fetal skin, liver, mamma, spleen (containing blood), blood, testis, kidney, lymph nodes, and mouse placenta (washed free of blood) had immunization against transplantable carcinoma; at the same time the lens, brain, cartilage, bone or muscle had no effects of immunization (1919).[59]

In the 1930s to 1940s, Dr. Emanuel Revici revealed the relation of pain and other symptoms to the pH (acid or alkaline) in the diseased area and urine.[60] He also explained that the application of placental extract in a group of patients with the same diagnoses, the effect of therapy could be positive or negative. So, in the group of patients with incurable cancer, Dr. Revici recommended using placental extract only in the case of acid urine.[61]

From the 1970s to the 1990s, Dr. Valentin Govallo used immunotherapy with placental extract to treat cancer.[62] In 1974, a clinical trial group of 45 patients with various advanced cancers received immunotherapy with placenta extract. In 1997, 29 out of 45 patients were still alive. Therefore, the 20-year survival rate was 64.4%.[63]

According to the patent granted in Taiwan in 2009, a fraction of mammal placental extract that includes a peptide with a molecular weight of less than three kDa had antitumor activity.[64]

In 2012, a report stated that placental extracts added to tumor cells would induce tumor cell differentiation *in vitro*. This effect was not dependent on the species of mammals used as the source of the placenta. Administration of placental extracts inhibited tumor growth and metastasis *in vitro* and *in vivo*. So, the concept of non-toxic biological therapy of cancer through the induction of tumor cell differentiation has obtained a scientific basis.[65]

Discovery of wound healing and regeneration effects by Dr. V. P. Filatov

Revival of therapeutic application of placenta for wound healing occurred in the 1940s to 1950s following the clinical trials of Vladimir P. Filatov, a surgeon, and ophthalmologist from Odessa (the Soviet Union). At the beginning of the 1930s, Dr. V. P. Filatov performed transplantation of cornea tissue taken from the human cadaver and received optimistic results.[66] In order to accelerate the process of regeneration and stimulate wound healing, Dr. Filatov used various types of preserved tissue and pieces of placenta, or placental extract. A new method of stimulation and rejuvenation gained the name '*Tissue Therapy*.'[67]

Efficacy of Placenta as a Galactagogue

Stimulation of lactation using the placenta has been reported by many doctors.[68–70] On the 6th of October 1915, at the meeting of the Tri-State Medical Society, Bertha Van Hoosen, from Chicago, shared her results of the application of dried placenta by women just after labor. Her presentation included the following story: "... The first report of our results came as a complaint from the nurses. They requested that the dosage (of the placenta) be cut down because the patient had so much milk that it was a burden to keep the breasts empty".[71]

In another research carried out in Los Angeles County Hospital, a group of healthy women ingested 0.6 g of desiccated placenta three

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times daily, commencing from the day of delivery. The diet was the same throughout the study for all the women in the trial and control groups. Quantitatively, the production level for lactose and protein had been raised while that for fat had been decreased slightly.[72]

The maternal ingestion of desiccated placenta also increased the growth and growth capacity of the breastfed infants above the usual occurrence. This effect was assumed to be due to the presence of unidentified growth-promoting substances in the placenta.[73]

Functional uterine bleeding was another gynecological disorder treated successfully using placenta extract.[74]

Development of a scientific basis for modern Organotherapy with the placenta

Throughout the centuries, doctors used the concept of "organ-specific remedies" to treat various diseased organs. It was widely known amongst physicians that the "brain helps the brain, and lungs heal the lungs," and so on.[75] This empiric idea was practical but quite far off from the scientific approach.

With the development of new laboratory diagnostic methods, finding a scientific explanation and objective confirmation of the previously used empiric Organotherapy became possible.

In the research published by Belonovsky and Miller (1928), extracts prepared from the various animal organs being injected into the experimental animals were accumulated mainly in the similar organs of the animals. This selective accumulation of the organ-specific substance called "organotaxis" was confirmed by adding dyes to organ-specific extracts.[76]

In 1955, it was proven by isotopes that after injections of extract prepared from a specific animal organ, its ingredients would mainly be spread in the target organ.[77]

In 1957, it was revealed that affinity between similar types of cells originating from various species was better than between different types of cells originating from the same species. For example, it was reported that "in the course of tissue reconstruction, the dissociated embryonic cells became grouped preferentially, according to their original type identities, regardless of their generic origin."[78]

In 2009, a new membrane-protective peptide was isolated from tissue of pigmented epithelium of bovine eyes. This peptide had a molecular weight of 4.372 kilo Dalton (kDa). The membrane-protective effect was observed at a concentration of 10^{-17} mg/mL.[79] In 2018, small biologically active peptides were isolated from the testicle tissue of cattle. These peptides increased the motility of human spermatozoa *in vitro* by 50-70%, and this effect persisted for several hours. A mixture of peptides included molecules with a molecular weight from 1 to 10 kDa and around 66 kDa; the concentration of active peptides varied from 10^{-8} to 10^{-15} mg/ml.[80] Biologically active peptides were isolated from the bovine ovarian tissue in another study. They improved the viability and maturation of follicles in ovarian tissue *in vitro*. A mixture of peptides included molecules with a molecular weight from 0.8 to 6 kDa and around 67 kDa; the concentration of peptides was 10^{-9} mg/ml.[81]

In 2019, a series of studies was carried out in the LC-MS/MS laboratory of the Jeffrey Cheah School of Medicine & Health Sciences, Monash University, Kuala Lumpur, Malaysia. The following results were obtained: the peptide content in the extracts of "rabbit placenta 1" and "rabbit placenta 2" were 89.42 and 96.08 µg/1 mL, respectively; the peptide content in the extract of rabbit kidney was 114.53 µg/1 mL; the peptide content in the extract of rabbit brain was 130.93 µg/1 mL; the peptide content in the mixture of the extracts obtained from rabbit placenta and mesenchyme (called 'APR') was 102.25 µg/1 mL; the peptide content in the mixture of the extracts obtained from rabbit kidney, placenta, liver, pancreas, spleen, stomach and intestinal mucosa, mesenchyme, smooth muscle, and nerves was 119.71 µg/1 mL, and so on.[82,83]

Sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) was applied to determine the molecular weight of peptides contained in the extracts of rabbit skin, mesenchyme, and the mixture of extracts of rabbit placenta and rabbit mesenchyme. The performed analysis has confirmed that all peptides had molecular weights of around ten kDa and less.[84]

Identifying proteins from a sample called 'APR' was performed using Liquid chromatography-mass spectrometry (LCMS-MS) [PEAKS Studio 7.0, Bioinformatics Solution Inc., Waterloo, ON, Canada]. LCMS-MS test revealed the following proteins and peptides: *Profilin* (10607 Da), *Acyl-CoA-binding protein* (9915 Da), *Small Muscle Protein X-linked Protein* (9397 Da), *Ubiquitin* (9397 Da), and *Thymosin beta-4* (5037 Da), etc.[85]

Practical application of Organotherapy with the placenta

Since ancient times, doctors have used the classic approach to selecting and prescribing various therapeutics. It had a foundation on the knowledge, experience, and clinical trials that lasted decades or hundreds of years. In each case, the doctor determined the etiology and pathogenesis of the disease and selected the most appropriate treatment. So, the classic treatment scheme meant that each protocol was tailored to one patient. With the accumulation of knowledge and experience of the particular doctor, his treatment's effectiveness increased, which depended on his hard work and talent. Nowadays, this medical practice sometimes falls into the "off-label" treatment category. The weakest points of this approach are the knowledge and experience of each practice doctor.

About 200 years ago, homeopathic physicians designed a new approach to clinical trials to test their remedies. They conducted multicenter trials where large groups of volunteers were involved. According to a historical document, Dr. Rudolf Virchow, the father of modern Pathology, criticized this new approach to the clinical trial. He insisted that despite certain similarities in pathology discovered in different patients with a similar disease, each patient has his disease, so instead of using statistics collected from large groups of patients, doctors should pay more attention to detailed analysis of each case.[86]

Nevertheless, a new standard was introduced into modern pharmacological research and became a foundation for "evidence-based medicine." They use relatively short clinical trials where large groups of patients with the same nosological diagnosis (or syndrome) are formed. All patients in these groups receive treatment with the study remedy according to the standard protocol. Based on the results obtained, the tested remedy is added to the list of drugs recommended for treating a particular disease or removed from this list. This approach has several weak points: first is the knowledge and experience of the doctor who designs the trial protocol; the second is the knowledge and experience of the doctor who forms the study and control groups because the results of the study are very sensitive to the homogeneity of the groups in the sense of the similarity of the key pathogenesis of the disease which is targeted by the tested drug. The additional factor that can affect the results of these trials is the variability of the

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sensitivity of the patients to the standard dose of the tested drug. When using Organotherapy, both approaches discussed above may be used.

It has already been proven by the previous generations of doctors that "the brain helps the brain, and lungs the lungs."[75] However, there are questions while prescribing extracts that affect the entire body, for example, placenta extracts, which were usually used based on the knowledge and experience of the previous generations.

A review published in 2012 listed the main indications when placenta extract is used nowadays. In particular, they use it to stimulate immunity, wound healing, reduce skin pigmentation, and treat various patients suffering from gynecological disorders and other pathological conditions.[55] This list of indications may be helpful for a doctor starting using placenta-origin therapeutics.

According to Dr. Emanuel Revici's research, the placenta extract's beneficial effect was observed if the patient's urine pH was acidic only. Therefore, measurement of urinary pH may be an essential sign for patient selection while prescribing placenta extract.[60,61]

If a doctor is familiar with the theory of traditional Chinese medicine, he can use placenta extract to treat "blood deficiency or/ and liver, lung or kidney Yang deficiency."[28] Besides, it was noticed that when the blood uric acid concentration increases, the patient has signs of "heat",[87] which presumably means a predominance of exothermic chemical reactions over endothermic. Thus a blood test on uric acid may be an additional criterion for selecting patients who can be prescribed the placenta extract and for whom its use is not recommended.

As research into organotherapy continues, more data will be available to physicians who use biological remedies. The recent isolation of the specific nano-peptides from the rabbit placenta extract, including *Profilin*, *Acyl-CoA-binding protein*, *Ubiquitin*, T*hymosin beta-4*, etc.[85] starts a new era of organotherapy. It helps doctors to use the placenta extract based on the effects described for the isolated peptides.

Conclusion

For many centuries and even millennia, doctors and healers have used Organotherapy empirically, which is based on their knowledge, practical experience, and clinical trials. In some cases, they prescribed organ-specific remedies prepared from specific animal organs which were relevant to the diseased organs of the patient. In other cases, doctors used active remedies to impact the patient's entire body. Among the remedies of animal origin, having general stimulation or rejuvenation effects, the placenta was the most popular one.

With the development of 'modern' science, specific functions and chemical and biochemical components of the placenta were identified. However, some active components of the animal and human-origin placenta were not known to science due to the insufficient sensitivity threshold of the laboratory equipment. Recently a group of nano-peptides was isolated from the extract prepared from rabbit placenta, including Profilin, Acyl-CoA-binding protein, Ubiquitin, Thymosin beta-4, and others.

One may assume that revealed proteins and peptides can be essential to the therapeutic effects obtained using extracts from the animal placenta and other organs and tissues. Hopefully, this discovery will start a new era in the research and clinical application of organo-therapeutic remedies in general and placental extracts in particular.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

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Hypothesis.

Acupoints, Channels and Organs

Mikhail Teppone

Medical Director, Bionion Sdn Bhd, N 1, Jalan Sungai Jeluh 32/192, Shah Alam, 40460, Selangor, Malaysia; email: mikhail.teppone@gmail.com

Abstract: According to traditional Chinese medicine, *Qi and Blood* circulate through the human body via pathways known as 'channels and collaterals'. This process supports the normal function of internal organs and the whole body. Pathological conditions can be attributed to abnormal circulation of *Qi and Blood*, which results in excess or deficiency of organs and channels. Therapeutic methods used in traditional Chinese medicine restore the balance of *Qi and Blood*. Since acupuncture was introduced in Europe, discussion and debate about the nature of 'acupoints,' 'channels,' and 'collaterals' has continued. Currently, opposing views exist on this subject, ranging from complete denial of the existence of the channels to uncovering the previously unknown system of intra-tissue gaps and microscopic vessels. The author offers an original hypothesis that regards the theory of channels and collaterals as the description of the physiology and pathology of intercellular space and the theory of organs as a description of the physiology and pathology of cells.

Keywords: traditional chinese medicine; TCM; acupoints; channels; collaterals

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Introduction

According to traditional Chinese medicine (TCM), *Qi and blood* circulate through the human body via pathways known as 'channels' and 'collaterals.' Since acupuncture was introduced in Europe, discussion and debate about the nature of 'acupoints,' 'channels,' and 'collaterals' has continued. There have been fewer questions about the nature of the 'organs' that resembled the concepts of classic medicine.

Scientific medicine made a significant step forward when Rudolf Virchow (1821-1902) defined a disease as a cellular pathology.[1] However, from that time, any extracellular disorders were almost ignored or deemed as functional diseases or pathologies of the connective tissue.[2] Perhaps due to the concept of cellular pathology, the idea of the traditional Chinese medicine of the channels, gaps, or tunnels distributed within a human body did not find a proper understanding.

1. Modern Discoveries in Morphology of Acupuncture Points

According to many researchers, there are no unique structures at the acupuncture points that are not present in other areas. However, the acupoint has an unusual combination of common structures, which allows it to be distinguished as a particular formation.

1.1. Acupuncture points exist in humans, animals and plants

The morphological and functional heterogeneity of human skin is described in TCM as "acupuncture points" and "skin zones." A similar morphological and functional heterogeneity is typical for warm-blooded animals,[3,4] such as elephants and dogs,[5,6] sheep,[7] goats,[7,8] donkeys,[7] rabbits,[7,9,10] cats,[7] horses,[6,11,12] pigs,[7,13] monkeys,[14] and birds,[15] as well as for frogs,[16] insects,[17] and plants.[18,19]

At the end of the XIX century, a Russian doctor, Grigory Zahar'in, and an English physician, Henry Head, discovered that internal organs diseases were accompanied by skin hyperesthesia in a particular location. Later, hypersensitive skin regions related to sick organs were called Zahar'in-Head's zones.[20,21] It was subsequently found that hyperesthesia zones may turn into hypoesthesia zones.[22] For example, it is known that in most patients an acute appendicitis is accompanied by

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hyperesthesia and vasodilatation in the projection area whereas the destructive form of appendicitis is marked by hypoesthesia and zone of dermal vascular constriction.[23]

Among the other discoveries of the reflex zones we can name the points of *McBurney*, *Lanz*, *Vaquez*, *Boas*, etc. Most of the "modern" reflex zones have a segmental innervation in common with the sick organ.[24-26] When it comes to the motor points known in neurology, only a few of them are also acupuncture points.[27,28]

In the fifties of the last century, a physician, Janet Travell, started actively using procaine injection into painful points to treat myofascial pain syndrome.[29,30] By the mid-80s, Janet Trevell, jointly with David Simons, came up with the theory of trigger points widely used by osteopaths, chiropractors, physiotherapists, and massage therapists for treating musculoskeletal system diseases. Unlike oriental medicine, based on the concept of vital energy (Qi) and its circulation in the human body, the theory of trigger points was based on the principles of European conventional medicine.[31]

In the middle of the 20th century G. Soulié de Morant wrote that the modern Chinese name of an acupuncture point sounds as *xue* [穴] or *kong xue* [孔穴] translated as "depression" or "entrance to the cave." [32,33] Around the same time A. Podshibyakin found that acupuncture points have increased oxygen consumption and increased temperature; he proposed to call them "biologically active points" (BAP).[16,34,35] Both definitions suggest that an acupuncture point is an area on the skin surface with the access to the active structure located inside the body.

According to some scholars, there is a mathematical model for the distribution of BAPs on the body, so the localization of each point can be calculated.[36,37]

1.2. Palpation of acupuncture points

Surface palpation of the BAP area will reveal a loosened-up tissue and an insignificant indent in the skin and the muscle [16,34] due to the thinning of the epidermis and a different areolar structure of the connective tissue in that area.[38,39] The location of BAP on the skin of cadavers manifests itself by small retractions that correspond histologically to the fibers of connective tissue positioned perpendicular to the skin surface and containing neurovascular elements stretching through all layers of the skin and reaching the epidermis.[40]

Relatively looser surface epithelium in the BAP area permits identification by palpation or by a metal probe with a rounded 2-3 mm diameter tip, as well as with an acoustic instrument that detects the changes of sound produced by the friction of the instrument against the skin surface.[41]

A feeling of soreness often accompanies a deep palpation of the point.[42-44] According to some authors, the soreness at a BAP point is present only in the case of a disease associated with that point because, after the recovery, sensitivity returns to normal.[45]

1.3. General morphology of acupuncture points

Morphological studies around the acupuncture points have not revealed any unusual structures that cannot be found in other parts of the body,[26,46-48] which sometimes leads to the conclusion that BAPs do not exist *de facto* and are nothing but topographic or reference points on the skin surface.[49]

According to other authors a BAP may be defined both as a functional unit and as a morphological formation where the effect of therapy with acupuncture is different from the effect outside the point.[44]

As a general rule the elements of the nervous and vascular system, as well as various cells are identified around the acupuncture points. J. Bossy, studied the morphology of numerous BAPs and in 42% of cases found subcutaneous nerves; in 40% the veins with subcutaneous perivascular nerve plexus, and in 18% cases found subcutaneous arteries.[50] In other laboratories, subcutaneous nerves, veins, and arteries were found in the area of BAPs in 80% of the cases.[51,52] P. Rabischong et al. reported the usual presence of spiral-shaped vascular plexus surrounded by nerve fibers of cholinergic type lacking myelin in BAP areas.[39]

Some authors have attempted to correlate acupuncture points with specific nerves, blood vessels, or their branches.[53] However, the analysis of a wide variety of morphological studies

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makes one doubt that the nerves, the blood vessels, or specific cells form the basis of an acupuncture point.

In 1959, G. Novinsky found that an areolar connective tissue with increased hydrophilic properties is typical for BAP projection area.[54] For that reason it is easier to separate the skin of cadavers from the underlying tissue in the BAPs than in other parts of the body.[41] Furthermore the epithelium around BAPs is thinner and looser and the fibers of the connective tissue are perpendicular to the skin surface.[26,55]

A special role is attributed to the morphological peculiarity of BAP in fascia in the places where neurovascular bundles or nerve fibers are reaching out from the depths to the surface layers of the skin.[40,56,57]

Fibers of connective tissue are located alongside such structures in such a way that the surface layers of the skin are connected to the parts deep inside the body. All cutaneous branches of spinal nerves perforate skin at least once and that area precisely coincides with a particular BAP.[38,58] The feeling that the needle is *"falling through*" in the acupuncture point familiar to all practitioners is most likely due to the needle hitting such perforation of surface fascia.[44]

According to N. Verzhbitskaya et al., BAP includes two morphologic-functional components: "channel of the point" and "locus" or the active area of the point.[59,60]

"Channel of the point" linking the skin's surface with a locus is formed by the epithelium and connective tissue fibers. There are few cellular elements, nerves, and blood vessels within a channel compared to the surrounding tissue, which makes penetration of the needle easy and painless to the depth of the "locus" located in subcutaneous fat tissue or between muscles and tendons.[59]

The "locus," or an active area of the point, is formed by loose connective tissue reminiscent of a polymorphic flask. A high content of nerves, vessels, and cells with a high content of heparin, histamine, acetylcholine, serotonin, catecholamines, and other active substances characterizes it.[59-61] The estimated schematics of the acupoints are shown in Figure 1.[62]

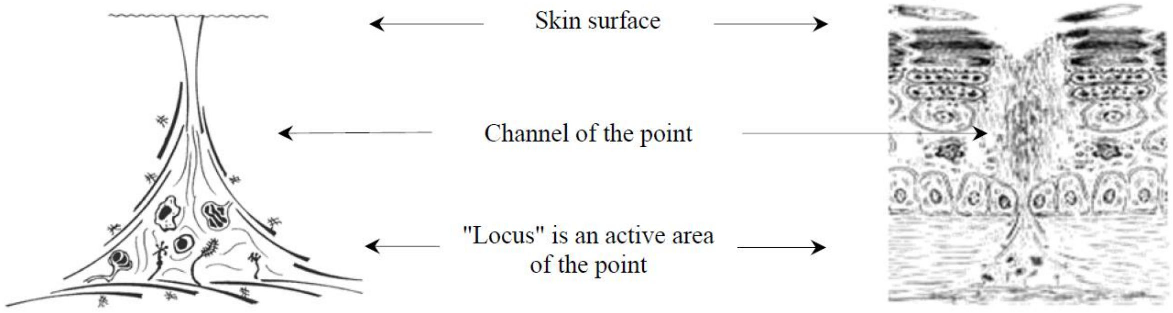

Figure 1. Schematics of an acupuncture point.

According to morphologic studies, different nerve receptors and free nerve ends are abundantly represented in acupuncture points.[48,63] The presence of a certain receptor depends on the localization of the points. The encapsulated receptors include Meissner's and Pacini's corpuscles, bulbos terminales Krause, muscle spindles, and spindle tendon (Golgi tendon organ). [26,38,63,64]

The number of nerve fibers per section of the tested dermis in the auricular points exceeds about two to three times the number of them in the dermis of the control skin areas.[64,65] Examination of BAP areas with ultrasound demonstrated that the receptors and the nerve structures presented within these areas and outside are different.[66]

A comparison of the acupuncture points along the pericardium channel revealed increased nerve structure density in the distal direction.[64] Other studies found that the number of sensory fibers in a distal part of an arm eleven times exceeds that of a forearm and almost twenty times that of a shoulder.[67] The receptor apparatus of the acupuncture points is similar to the reflexogenic zones of Zahar'in - Head, McBurney, Mac-Kenzie, Vidal, and others.[68,69]

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The Laser Doppler flowmetry revealed that the blood flow through the microcirculatory vessels in the area of acupuncture points (GI-4 and V-64) is significantly higher than in the surrounding tissue.[70]

Fibroblasts, histiocytes, leukocytes, and mast cells may be discovered at the active area or "locus." [60,61] The number of mast cells is more significant in the area of acupuncture points than in the areas outside the points. Mast cells found in the area of acupuncture points have a high content of biologically active substances such as histamine, serotonin, and heparin, which affect vascular permeability, microcirculation, tissue metabolism, and skin conductivity. The number of cells with signs of degranulation increases after acupuncture treatments, and a preliminary blockade of degranulation of mast cells leads to the decreased effect of acupuncture.[71]

In the area of acupoints, many gap junctions are detected. Gap junctions connect cells to ensure intercellular transporting cytoplasm and dissolved substances, including c-AMP, RNA, and low molecular weight proteins. Increased concentration of gap junctions leads to high electrical conductivity of skin at acupoints area. [72-74]

The evaluation of a microwave signal reflected from the skin surface led to the conclusion that BAPs are more hydrated as compared to the control skin areas.[75]

Modern diagnostic methods permit specifying the shape and macroscopic localization of the point's active areas. For example, X-ray fluorescence analysis revealed that the acupuncture points of the extremities are elliptical with elongated axis alongside the meridians.[76] In another experiment, acupuncture needles were introduced in Bl-25 (*Da Chang Shu*) and Bl-26 (*Guan Yuan Shu*) points with subsequent manipulation to achieve sensory reactions propagated along the channel. Computer tomography revealed that the localization of the above points corresponds to the intermuscular septum between the spinal erector (*m. Erector spinae*) and transversospinal muscle (*m. Transversospinalis*).[77]

2. Modern discoveries in physiology of acupuncture points

Morphological differences in acupuncture points suggest functional differences between the acupoints and the surrounding skin. These distinctive features are reduced electrical resistance of the skin, increased electrical capacity, high thermal conductivity, low-frequency electrical signals, and other "abnormalities."

2.1. Reduced skin resistance of the areas of the acupuncture points

In the early 1950s, a Japanese doctor, Yoshio Nakatani, found a reduced electrical resistance around the points and developed a diagnostic method based on conductivity measurements at specific points of each channel.[78-80] Around the same time, similar studies were conducted by other scientists, including A. Podshibiakin in the USSR,[35] J.E.H. Niboyet in France,[81,82] and R. Voll in Germany.[83-85] Subsequently, the electrical "anomalies" of the skin in the area of BAP were studied by T. Ischikava, [86] C. Ionescu-Tirgoviste,[87] I. Dumitrescu),[88,89] F. Portnov,[90] P. Chan,[91] and numerous other researchers.

The electrical resistance of the skin for indifferent areas varies from 250 Kilo-Ohm to 1 or 2,74 or 10 Mega-Ohm,[55,88] but in the area of the acupuncture points, it could be reduced up to 20 ÷ 60 Kilo-Ohm.[55,81,92] In the studies of A. Podshibiakin, the resistance at acupuncture points with the negative active electrode was 20 ± 10 Kilo-Ohm. With a positive electrode, it initially went down but subsequently increased within 20-60 seconds to 0.4 ÷ 0.5 Mega-Ohm.[16] Due to low resistance in acupuncture points, they may be visualized in the high-frequency corona discharge of *AcuVision* device.[62,93] (Figure 2)

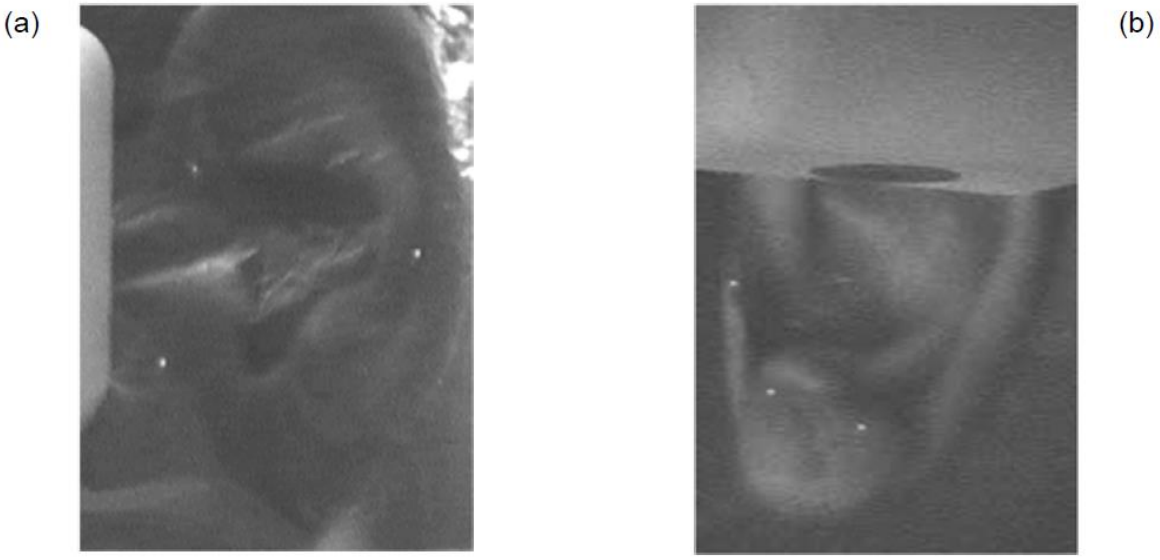

Figure 2. (a) Visualization of low electrical resistance points on the auricle of a living person. (b) Visualization of low electrical resistance points on a cadaver one day after the death.[62]

Localization of the electrically conductive spot in the same person may be displaced in any direction to a distance of up to 1 cm and even more;[16,94] however, the localization of the electroconductive points predominantly coincides with the localization of the acupuncture points.

The size of an electrically conductive spot varies from 1mm to 10 mm. During sleep and after creative workload, the diameter of the point is reduced to 1 mm; after waking, it may increase to 10 mm. During a disease, the size of conductive spots may increase so that individual "points" overlap and form vast areas.[16,95]

The highest electrical conductivity was found at the points located on the head. In the central part of the body (for example, around the sacrum), the conductivity is higher than on the limbs, where it decreases as it approaches the fingertips and toes.[96]

In the case of certain conditions, the conductivity of a point may be the same as that of the surrounding skin areas or even lower.[96] In some studies of healthy individuals, no points with reduced conductivity were found; therefore, some authors argue that there is no difference in electrical resistance between acupuncture points and surrounding skin.[97] However, in most cases, there are more points with reduced electrical resistance than the known acupuncture points.[98]

Given the fact that it is not always possible to find the complete correlation between the detected points of electrical conductivity and the "acupuncture points" [98-100], it is possible to assume that this is due to the functional displacement of the conductive patch only. However, the main component of the point (locus) most likely remains at the standard location without any displacement.

Transplanted skin loses its original properties immediately after separation from its original location and acquires the electrical characteristics of the skin area of the new location. As a result, lowered resistance typical for the "points" appears in the skin transplanted from an indifferent area to an acupuncture point.[101,102] Conversely, low resistance is no longer observed when skin is transplanted from the BAP region to a common area. Given the above, some authors assume that an "acupuncture point" is a complex unit associated with specific deep structures.[103]

Even though electrical parameters in acupuncture points are susceptible to fluctuations depending on many internal and external factors, the average daily indexes of electrical resistance in specific "*points*" registered under constant conditions are relatively stable and reflect the individual characteristics of the subjects.[104]

The study of the semi-conductivity of the points revealed the coincidence of the changes with the daily dynamics of atmospheric electrical conductivity. At maximal conductivity of the

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atmosphere (as a general rule at night), the electrical conductivity of the points goes down and increases with the change of weather.[105]

Electrical conductivity in men and women reduces to minimal at night between 2:00 a.m. and 5:00 a.m. and coincides with a deep sleep. In the daytime, the dynamics of electrical conductivity depend on the gender of the subjects. In men, maximum values were found between 11 a.m. and 2:00 p.m., and in women, between 4:00 p.m. and 9:00 p.m.[106]

In the days of high geomagnetic activity (high K-index), the resistance at the points was 40-80% higher than the daily average calculated for the days with low K-index.[104] Conductivity is maximal in the periods of low geomagnetic activity.[107] Long-term observations found a decrease in electrical conductivity in winter and an increase in summer correlating with average monthly air temperature.[106]

Note: Geomagnetic activity indices are intended to describe the variations of the Earth's magnetic field. K-index - is a quasi-logarithmic index (incremented by 1 with disturbance increasing approximately two times). It is calculated according to the data of a specific Observatory for the three-hour periods. The index was introduced by J. Bartels in 1938 and ranges from 0 to 9 for each three-hour interval (0-3, 3-6, 6-9, etc.) of the Greenwich Mean Time. In order to calculate the index, the change of the magnetic field within a three-hour interval is taken, and a regular part (determined by calm days) is subtracted from it. The resulting value is converted into a K-index according to a special table.[108]

Numerous authors have reported that the electrical conductivity of specific points depends on the changes in physiological and pathological conditions of the associated channels, organs, and the body as a whole.[80,85,109] It was found that the Bl-64 (*Jing-Gu*) point's electrical conductivity increases when the person wakes up and decreases during sleep. It is reduced in case of a reduction of overall reactivity, but it does not change with psycho-emotional stress.[110]

Electrical resistance in the BAPs also depends on the autonomic nervous system condition. It increases when the activity of the sympathetic division of the autonomic nervous system is below the normal condition.[46]

The change in conductivity is observed in the presence of macroscopic structural changes in the skin. In patients with psoriasis, the resistance around the papules is lower than in the surrounding skin and even lower, closer to acupuncture points in the area of the papules.[9] The study of the location of birthmarks, moles, and nevi revealed that they frequently coincide with the acupuncture points. In both cases, the reduced electrical resistance of the skin was observed.[111] However, nevi, birthmarks, and moles do not possess high thermal conductivity, which is typical for acupuncture points.[111]

Electrical heterogeneity of the skin persists from several days to one week after death. This phenomenon was revealed in the parts after the dissection of cadavers and for the whole cadavers.[81,88,112-114] Skin heterogeneity on amputated limbs is observed for up to three days.[9,59] The difference in resistance between the points and the surrounding skin is far more considerable on the cadavers than on living humans and animals.[82,92,115,116] Electrical heterogeneity in cadavers disappears gradually due to autolytic processes that cause the physical parameters of the skin to align.[40,81,82,92,115,116]. They concluded that the structures located in the area of electrically abnormal points are more stable than in the surrounding skin area.[9]

However, one can assume that the high electrical conductivity of the skin in the area of acupuncture points is associated with the absence of insulating structures. Thus, the conductivity function does not require metabolic activity, so it creates an impression of stability of the acupoints after death.

2.2. Electrical potential and action potential in the "acupuncture points"

In 1825, professor of Physics Claude Pouilett was the first to use a galvanometer to discover the electrical potential between the needle inserted into the acupuncture point and an oral mucosa.[117]

The study of electrical potentials (EP) in different skin areas revealed differences in potentials between the centers of the acupuncture points and the surrounding skin. EP may vary from 2 to 300 mV, decreasing with the distance from the center. Average values of the difference in potential may vary during the day, reflecting the moderate fluctuations in the functional activity of internal organs.[16,35,96,118]

Thus, an increase of the EP in the urinary bladder meridian points is observed when the bladder is full and returns to normal after emptying. An increase in EP of the Stomach meridian points will follow if a patient is suggested under hypnosis that he had eaten well. Novocaine blockade causes a decrease in the EP.[35]

Some authors have noted slow, low-amplitude irregular fluctuations of the electrical potential ranging from 0.1 to 1.0 Hz with amplitude from 50 to 500 mV. This biological potential is constant and subject to the general laws of galvanic skin response.[119]

An above-normal difference of (electrical) potentials may indicate the presence of a disease, a predisposition to one, or the presence of a residual pathology in a relevant organ.[16,35,118,120-122] Electrical potential in the point has a tendency to decrease as recovery progresses.[122]

When acupuncture is used on the points with deviated electrical potential, a reflex reaction is observed in the corresponding internal organ. According to A. Podshibiakin, a positive effect from treatment, was observed when electrical potentials in the active points of the skin exceeded 25 mV. Treatment of the acupoints with electrical potential under 10 mV (especially – 1 mV) has a negative effect on the analogous electrical current used for treatment.[118]

The pattern of electric potential distribution on the skin persists for several days after death until autolytic processes reduce the difference to a minimal one that can no longer be recognized.[118]

Apart from an electrical potential at the BATs, they also can register an action potential (AP) of a high-frequency impulse activity. AP fluctuations' frequencies vary from 0.5 Hz to 400 Hz and have amplitude from 0.1 to 1.5 mV and duration of 0.3 – 1.25 milliseconds. AP in the "point" is registered only alongside certain sensations and may last 20-30 minutes.[123] The frequency characteristics of AP are higher with active pain syndrome and go down with pain relief. The maximum values of AP are recorded at inspiration.[123-126]

Action potential in auricular points is detected only in the presence of a pathological process in the relevant organ and disappears as recovery progresses.[46]

2.3. Other Electrical Characteristics of "Acupuncture Points".

Study of the volt-ampere characteristic in BAP areas revealed nonlinear curves including an S-shaped curve with a part of a negative differential resistance. This data suggest that the tissues surrounding BAPs may possess generating properties and may convert a direct electric current into alternating.[127]

Apart from high conductivity the acupuncture points have capacitive characteristics that permit them to accumulate and keep an electrical charge much longer than the surrounding tissues. According to the research of I. Dumitrescu the capacity in the area of the points may reach 0.5 microfarad whereas the capacity elsewhere does not exceed 0.01 microfarad.[128,129]

Periodic low-frequency electrical signals ranging from 0.1 to 100 Hz are also found in the "points" in contrast to the noise-like signals in the surrounding skin areas.[130-131] These signals differ from the periodic processes in the nervous system that reach up to a thousand Hz.[131]

2.4. Skin temperature parameters around acupuncture points

Studies by A. Podshibyakin in the mid-20th century found high activity of metabolic processes and an increase in local temperature in acupuncture points. Other authors confirmed his results.[16,132]

A comprehensive study of the BAP's functional condition indicates that the activated points are hot, and the non-active ones are cold. Therefore, the "points" condition may prompt the treatment technique.[133] Specific pathologies cause the increase of hot "point" or zone size alongside the heat emission.[134]

A change in temperature sensitivity around acupuncture points was noted alongside the temperature changes. A Japanese doctor Kobe Akabane, was one of the first to discover this phenomenon. In 1952, K. Akabane treated the right side tonsillitis with hot foot baths. During one of

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these procedures, he noted that the little finger of the right foot was not as sensitive to hot water as the little finger of the left foot. After the recovery, he noted that the sensitivity was normal and symmetrical. Several experiments led Akabane to the conclusion that the functional activity of a meridian affects the thermal and pain sensitivity of the endpoints of the meridians (Jing).[135] Subsequently, N. Bogdanov found the changes in the thermal sensitivity of auricular points corresponding to specific pathological processes.[124,136]

The high thermal conductivity of skin around the acupuncture "points" led to the hypothesis that the "points" serve as a kind of sluice channel for heat exchange between the body and the ambient environment.[42,94,137]

The high thermal conductivity of skin in the area of the points can be used to determine the location of the "points accurately." When a metal probe moves slowly and without pressure around an acupuncture point, a patient feels something like a "*drop of cold water*" on the skin (with increased thermal conductivity) at the acupoints. Individual temperature sensitivity differs, so using several probes of different heat capacities is necessary.

Acupuncture and moxibustion permit the change of a natural heat transfer. The needles have an effect similar to cold and increase heat emission from the points to the environment.[42,137,138] Within the first minute after a needle is inserted into a point, the radiation temperature in that area increases by 0.4 - 2.3 ° C, and at a distance of 5 cm from the needle, it is reduced by 0.6 - 3.0 ° C. The temperature on the needle handle fluctuates between the values in the BAP zone and those at a distance of 5 cm from the BAP. 2-6 minutes after insertion of the needle, the radiation temperature of the skin around it continues to increase as it goes down on the farther skin areas. If a needle is not extracted for the next 30-40 minutes, the temperature of the BAP area gradually goes down and becomes significantly lower than it was initially.[138]

2.5. Relationship between electrical, temperature, and other point parameters

According to A. Wein, a skin temperature indirectly reflects the condition of the parasympathetic division of an autonomic nervous system, and electrical conductivity reflects the condition of the sympathetic division of an autonomic nervous system.[139]

Some studies found the relationship between conductivity, temperature, and pain sensitivity in acupuncture points. As a general rule, an increase in temperature in the points is accompanied by an increase in conductivity,[96] and an increased conductivity in the points correlates with the intensity of pain.[140,141] However, A. Nechushkin found no direct correlation between pain sensitivity, electrical conductivity, and temperature at the points.[142]

2.6. Other "physical anomalies" of acupuncture points

Other peculiarities of the acupuncture point areas have also been identified apart from the electrical and thermal "anormalies" that distinguish such areas from the surrounding skin.

According to A. Podshibyakin, BAP areas have increased oxygen absorption and release of carbon dioxide. Initially, the increased molecular oxygen tension starts to drop right after achieving the "*De Qi*" or "*De Chi*" phenomenon, which is observed at the treated point and other points of the same channel.[16,143] High functional activity of the BAP area is accompanied by increased incorporation of radioactive phosphorus (P32).[144-146]

Research with laser instruments detected mechanical vibrations of the needle's handle inserted into acupuncture points. The oscillation frequency was within two ranges: from 7 to 10 Hz and 15 to 20 Hz, in contrast to the surrounding skin, where only noise spectrum vibrations were found.[147] Periodic mechanical activity at points was not related to the pulsation of the arteries.[148]

Feeble spontaneous visible light (ultra-weak photon emission) was detected around the end (*Jing*) points of the channels, with the intensity of such light increasing mainly on the channels associated with a sick organ.[149] Measurement of the light diffusing properties found a more intense absorption in the visible light around BAPs compared to indifferent skin areas.[150,151] The values of the light diffusion coefficient at the points reach maximum at noon, at 6:00 p.m., at midnight, and at 3:00 a.m. The values are minimal at 6:00 a.m., 9:00 am, 3:00 pm, and 9:00 pm.[151] The diseases of internal

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organs change the diffusing properties of the points. A short laser exposure (under 60 seconds) reduces light diffusing properties, and after a long-term exposure (60-120 seconds) returns it to the initial level.[152] Increased skin sensitivity to high-frequency electromagnetic radiation was also observed in BAP areas.[75,153]

Due to the variety of the above properties of "acupuncture points," some authors suggest that the "points" play the role of multifunctional receptors,[52] capable of responding to signals of different natures, including electric, magnetic, and electromagnetic fields.[132,154-157] In this case, the inserted acupuncture needle can be an antenna that captures electromagnetic waves of a specific range.[158]

Summarizing the above and taking into account the Chinese characters 孔穴 (*Kong Xue*), used for acupoints and translated as a "aperture", "cavity" or a "hole," [159-161] we may conclude that the acupuncture point is a locus in the skin where a loosening of surface epithelium and specific connective tissue organization create an invisible "hole" which provides "access" to the inside the body. A large number of active elements discovered inside the "hole" turn the acupoint into a complex functional unit that facilitates interaction between the internal and external environment of the body. (Figure 1)

3. Modern discoveries in morphology of channels and collaterals

According to TCM theory, Qi and blood circulate along specific paths called "channels and collaterals." There are twelve Regular channels and the associated secondary vessels, including tendon-muscular channels (or sinews, or muscle regions), Luo channels or collaterals, and divergent channels as well as extra-channels. (Figure 3)

Centuries ago, a famous Chinese doctor, Li Shizhen, wrote: "... there are tunnels within the body and the one turning his mental gaze into himself may illuminate them..." [162]

European anatomists and physiologists have been trying to unravel the nature of channels for several centuries. The results of these studies and suggested hypotheses, which may be divided into the following groups:

1. Denial of the possibility of the existence of the system of channels and collaterals;
2. The theory of channels describes nervous and vascular systems;
3. The theory of channels describes muscles and subcutaneous tissue;
4. The theory of channels describes a system of electrical conductors and semiconductors;
5. The theory of channels describes a system of the conductors of the heat;
6. Channels are "immaterial pathways" transmitting electromagnetic waves;
7. Channels are independent and previously unknown bodily systems;
8. The theory of channels describes the physiology and pathology of connective tissue;
9. The theory of channels describes interstitial openings and bodily cavities;
10. Other hypotheses that explain the transmission of signals along the channels.

Despite the difference in the viewpoints on the nature of the channels, most acupuncturists agree that the concept of channels makes it easier to represent the system and the locations of the acupuncture points and improves the efficacy of acupuncture diagnostics and treatment.[44,49,163]

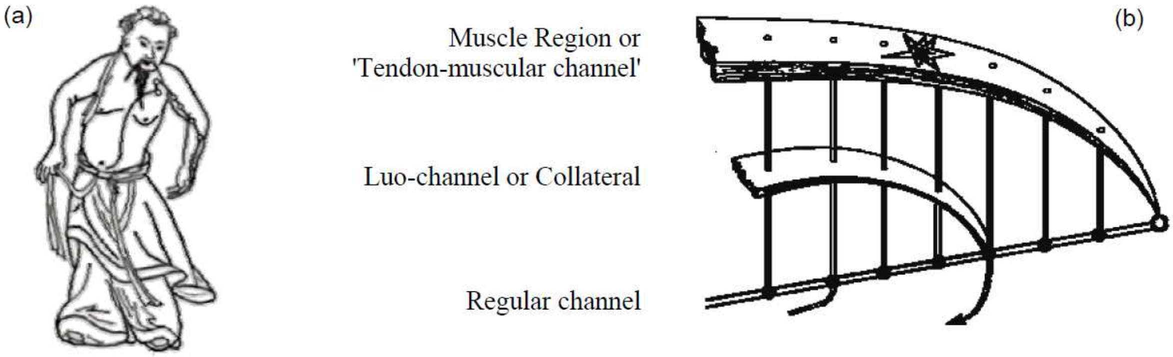
(a)
Muscle Region or 'Tendon-muscular channel'
Luo-channel or Collateral
Regular channel
(b)

Figure 3. (a) Channels as depicted in old Chinese books on acupuncture. (b) The original schematics of a layout of channels and collaterals.

3.1. The denial of the possibility of the existence of the system of channels and collaterals

Many reputable experts in the field of neurophysiology and acupuncture are categorically against recognizing channels as separate functional and morphological formations.[46,48,49,163,164] Some voice an opinion that the channels are strictly a functional concept, and the regularity of linear positioning of acupuncture points can be explained by the presence of interneuron connections formed during embryogenesis at different levels of the central nervous system. [44,53,165] According to Erich W. Stiefvater, the system of channels and collaterals in its classical sense is too primitive from the viewpoint of modern biology.[69]

The term "meridian" (meaning an imaginary line conditionally connecting functionally similar acupuncture points) was introduced in the middle of the 20th century thanks to Soulié de Morant, a founder of the French school of acupuncture.[33]

3.2. Theory of channels describes nervous and vascular systems

The assumption about the likeness between channels, nerves, and vessels can be made due to similarities between the paths of the channels and the topography of neurovascular bundles.[33,166,167]

The first Latin translations of literature on Traditional Chinese Medicine published in Europe used the term "paths" that circulate "the blood and the spirit" to convey the meaning of Jing-Luo ("channels and collaterals"). However, the dissertation of Willem ten Rhijne described channels and collaterals as blood vessels, which resulted in an erroneous view that identified TCM channels with the blood vessels known to European medicine.[168,169] Later, a Russian doctor, A. Tatarinov (1853), wrote that the Chinese doctors used the term "Jing" (channels) sometimes to describe the nerves and sometimes to describe the tendons.[170] Similar views were expressed by other researchers who studied acupuncture points and channels, or practiced acupuncture.

G. Soulié de Morant (1957) and Fr. Hübotter (1929) associated nerve stems with Yang-related channels and the vessels with Yin-related channels.[33,171] H. Goux (1955) suggested that the channel theory describes the physiology and the pathology of the autonomic nervous system (ANS), with the sympathetic section of the system belonging to the Yang channels and the parasympathetic belonging to the Yin channels.[172] R. de La Fuÿe and H. Shmidt (1952),[173] held a similar view in their joint work, as well as G. Bachmann. (1959).[174]

Dr. R. de La Fuÿe explained the mechanisms of acupuncture from the viewpoint of establishing skin-visceral connections in embryogenesis, noting that the nervous system and the skin have ecto-dermal origin. In contrast, the internal organs have meso- and endo-dermal origin. Communication between the internal organs, the nervous system, and the skin is realized during the process of organogenesis as the elements of the nervous system grow into the internal organs.[175] Dr. J. Hu

(1975), in the article "Neural basis of meridians and acupuncture points," noted the closeness of the channel trajectory and the distribution of dermatomes.[176]

Gong Qihua et al. (1979) made a note of the topographical closeness of the paths of the meridians and lymphatic vessels, as well as of the fact that the spread of lymphangitis is triggered by trauma of a thumb in the L-1 (*Shao Shan*g) area alongside the path of the lung meridian. In the experiments on cadavers, when a colorant was introduced in the region of Yin meridian distal points, such as the L-1 (*Shao Shan*g) point, it spread along the lymphatic paths alongside the relevant meridians.[177] A close relationship between the meridians and lymphatic vessels was also pointed out by R. Voll (1966), who had even singled out a particular lymphatic meridian.[83]

Summarizing the data available in the early 1960s, V. Vogralik described meridians as nervous conductors within integuments that weave around lymph and blood vessels and muscles and then transition into the nerve plexus, spinal cord, and brain, and then to the nerves going to internal organs.[53]

3.3. Theory of channels describes muscles and subcutaneous tissue

In the mid-50s, a Japanese physician, R. Fujita (1955), noted that the outer pathway of the meridians coincides with the lines of muscle contraction. He described the painful points as nodes of densification that appear in subcutaneous tissue in case of disease of internal organs.[178,179] American author F. Warren (1981) noted that the foci of neuro-myofibrosis coincide with the acupuncture points.[180]

Even though up to 70% of trigger point coincides with the localization of the BAPs used for pain treatment, R. Melzack et al. (1977) believed that the concept of "acupuncture point" is much broader than of the "trigger point." [181] Some doubts were expressed about the very existence of any independent trigger points that are not acupuncture points.[182]

3.4. The theory of channels describes a system of electrical conductors and semiconductors

As electrical conductivity within the points of the same channel is higher than between the points of different channels, it was suggested that the theory of channels and collaterals describes the physiology and pathology of the system of electrical conductors and semiconductors.

In 1950s, Dr. Y. Nakatani measured the electrical conductivity of the skin of a patient with chronic nephritis and found on his back a point with an increased electrical conductivity. As suggested by Prof. K. Sasagawa of the Department of Physiology, University of Kyoto, the points with increased conductivity were called *riodoten*. The line along which they were found was called *ryodoraku*: (ryo) - good, (do) - conductivity, (raku) - line or meridian.[79,80,183] Later, the results of Y. Nakatani were confirmed by modern scientists [184].

Similar findings confirming lower resistance between the points within the same channel were discovered by a Soviet scientist A. Podshibyakin,[35] a French scientist J. Niboyet,[81,92] a German physician R. Voll),[83-85] and many others.

A Nobel Prize Winner in Physiology and Medicine (1937), A. Szent-Györgyi was one of the first to point out the possibility of semiconductor effect in the human body. In 1941, he suggested that the migration of electrons in the conduction zones of protein structures with properties similar to those of semiconductor crystals may play an essential role in some biological processes.[185] Given that the effect is present in nucleoproteins (rather than in the proteins or the nucleic acids), the active protein structure should be compared to an impure molecular crystal.[186]

In 1976, V. Nikiforov repeated the hypothesis that a living organism is a giant bio-semiconductor containing numerous zones of conductivity and semiconductivity. The channels (meridians) are conductors presented in the body's integument that weave around lymphatic and blood vessels, muscles, and internal organs. The system of conductors or channels is the essential system that integrates all the other regulatory systems and the body as a whole. End portions of the meridians have the highest functional activity and are the points of the highest electrical conductivity.[105]

H. Schuldt (1976) measured electrical potential on the surface of the human body and concluded that the meridians are located along the lines of maximum concentration of electrical fields.[187]

After a series of experiments with the electrical conductivity of the channels, R. Becker (1987) suggested that the transfer of energy and interaction within the meridian system goes along the glial cells of the nervous system according to semiconductor principles. The glial cells transmit direct electrical current of small amplitude at low speed, unlike the neuron that transmits high-frequency electrical signals at high speed. According to R. Becker, that particular weak direct electrical current is the manifestation of simple electrophysiological mechanisms ensuring regeneration and restoration of the function of nerve fibers in case of trauma.[188]

Research of the channel conductivity with the electrode located by ultrasound suggests that the reduced resistance along the channels is due to the loose connective tissue that fills the gaps between the muscles or between the muscles and the bones.[189]

Thus, we can assume that in a multicellular organism, the channels serve as conductors of electric current.[96]

3.5. The theory of channels describes a system of the conductors of the heat

Due to the high thermal conductivity of the skin in the acupuncture "points" and between the points within the same channel, A. Romodanov, O. Butenko, D. Lyaschenko, and some other authors suggested that the channels represent a system of thermal field conductors, and the "acupuncture points" serve as the gateway for heat exchange between the body and the environment.[42,94,138,190]

3.6. Channels are "immaterial pathways" transmitting electromagnetic waves

Alexander Gurwitsch (1922) and George Lakhovsky (1929) were the first to describe the function of the cells based on radiophysical theory. G. Lakhovsky even applied electromagnetic fields to treat plants, animals, and humans.[191-193] In 1932, Harold Burr, observing the proliferation of nerve cells in the water lizard (*Ambystoma mexicanum Hope*), designed a theory of electrodynamic development of the living body.[194]

The wave model that explains the growth and development, physiology, and pathology of living subjects was later used in the works of A. Leontowitsch (1933), [195] S. Turlygin,(1942), [196] F.Popp (1978), [197] and many others.

As the efficacy of acupuncture was confirmed over many centuries of practice, however, no morphological substrates of channels were identified, some scientists attempted to explain the channels as "immaterial" ways of transmitting electromagnetic waves.[107] For example, A. Lebarbier (1975) stated that the meridians were the power lines of an electromagnetic field that are not defined by the anatomy but are detected by electronic instruments.[198] Sergey Sit'ko, one of the developers of microwave resonance therapy, suggested that the meridian system of living subjects has an electromagnetic nature and may be regarded as a mathematical solution of some limit cycles, both periodic and stable over time and space. In other words, the points and the channels are the projections of the solution of these limit cycles on a three-dimensional living object.[199,200]

3.7. Channels are independent and previously unknown bodily systems

Various authors assumed the presence of an independent self-regulating system within a body. According to N. V. Quan (1936), channels are real rather than imaginary lines with the properties different from such known anatomical entities as nerves and blood vessels.[45] Though normal functioning of channels is associated with the nervous system, they are not a nervous system in the ordinary sense. Probably, in terms of evolution theory, the system of channels and collaterals is simpler and more "ancient" as compared to the nervous and vascular systems.[96]

Russian scientists A. Zhirmunsky (1979) and L. Savina (1983) voiced the opinion that there existed the 3rd regulatory system of the body.[107,201] A. Zhirmunsky assumed that the main function of that system is the transfer of information from the peripheral parts of the body associated with the environment to the body, as well as information transfer within the internal organs and to its periphery.[201]

In 1961-1962, North Korean biologist *Kim Bong Han* (Figure 4), invented the method of coloring living and actively functioning tissues and discovered the previously unknown anatomic-histological "Kyung-Rak" system that differs from the nervous, circulatory, and lymphatic systems.[202]

Figure 4. A modified photo of Dr. Kim Bong Han (1916-1966), taken from his book.[202]

According to Dr. K. Han, Kyung-Rak system consists of specific Bonghan's corpuscles located in the area of biologically active points, linked with each other by the Bonghan's ducts, with circulating viscous liquid containing high concentrations of DNA and RNA molecules. Bonghan's corpuscles are surrounded by connective tissue with a relatively high content of tissue fluid.[202] (Figure 5)

Kim Bong Han's discovery was confirmed by Japanese scientists only.[203] Scientists from other countries were unable to confirm the Kyung-Rak system.[51,204,205] According to G. Kellner, who also researched that matter, the structure identified by Kim Bong Han was an artifact.[26] Due to the absence of Kyung-Rak system confirmation by scientists from other countries, the research in North Korea was stopped, and the laboratory was disbanded. The further fate of Kim Bong Han is not known.

In 2002, a South Korean scientist Jiang Xiaowen et al., described the technique that allowed them to identify the structures previously described by *Kim Bong Han*. It turned out that these intravascular channels of a diameter under 50 µm are restricted with a whitish, semi-transparent, soft, and flexible wall that is easily destroyed during a conventional histological examination. In order to identify, it is necessary to introduce intravenously in a live subject a 10% dextrose solution and cause blood coagulation and blood depositing around the studied intravascular channels.[206,207]

Subsequently, there came a series of publications on the morphology, physiology, and pathology of the Kyung-Rak system. A newly re-discovered structure got the name of "Primo Vascular System".[208-213] "Bonghan" ducts and tubes were found in blood and lymph vessels,[209,214,215] in fat tissue, [215] and on the surfaces of internal organs.[216] The flow rate of Bonghan fluid within the tubes is 0.3 mm/sec, which is significantly lower than the movement of blood or lymph.[217]

It is assumed that this system plays an important role in the process of tissue regeneration and metastasis.[218-221]

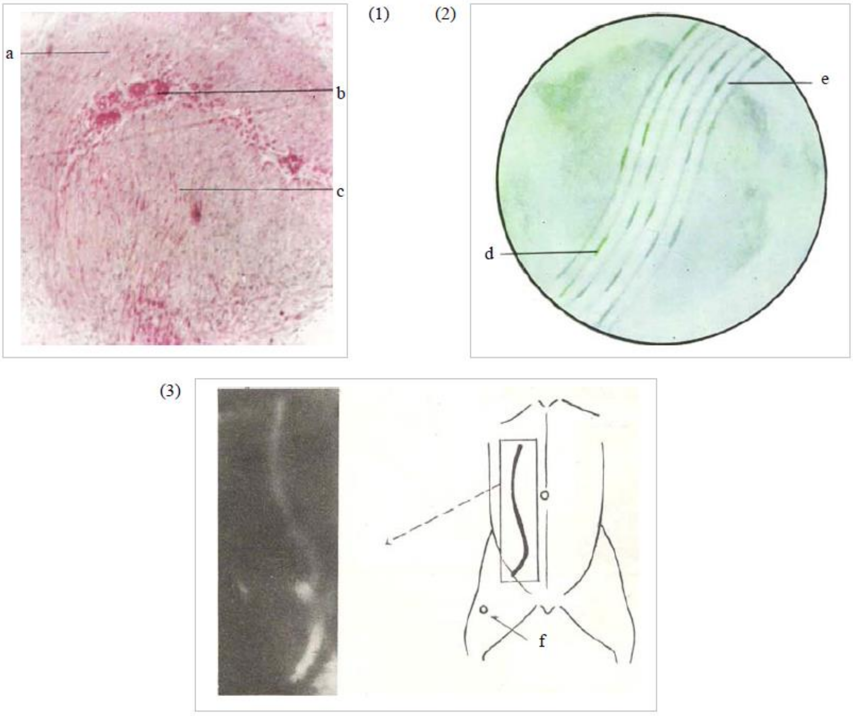

Figure 5. Illustrations from the book "On the Kyungrak System", by Kim Bong Han.[202] (1) Figure 6: Cross section of superficial Bonghan corpuscle (16x6.3) a. Thin outer smooth muscle fiber layer; b. Inner substance; c. Thick outer smooth muscle layer. (2) Figure 20: Phase-contrast microscopic observation of Bonghan duct: d. Endothelial nuclei of Bonghan ductule; e. Bonghan ductule. (3) Figure 27. Radioautogram after thew injection of P^{32} into a Bonghan corpuscle on the inner-side of a rabbit femur: f. Injection point.

3.8. The theory of channels describes the physiology and pathology of connective tissue

The hypotheses presuming that the elements of areolar and fibrous connective tissues made of proteins with semiconductor properties that transmit various kinds of energy are the morphological base of the meridians are in a separate group.[222]

In the eighties of the last century, a Japanese physician, H. Motoyama (1980), investigated the electrical conductivity of acupuncture points and concluded that it is a highly hydrated phase of the connective tissue of the skin that plays a leading role in the conductivity of electrical current. Therefore, connective tissue serves as the physical basis of the so-called system of channels and collaterals.[223,224]

A. Umanskaya (1984) stated that the channels are the terminal formation of connective tissue with countless bilateral connections (both between the elements and the peripheral parts of the central nervous system, organs, and organ systems). Acupuncture points are the locations for the filtration of a complex range of external inputs and their transformation into the signals appropriate for the nervous system.[225]

At the end of the 1980s, Chinese authors, J. Yuchi (1986) and X Du (1989), noted a strong correlation between the connective tissue and the channels.[226,227] Around the same time, the famous Swedish radiologist, Dr. B. Nordenstrom (1989), suggested that a vascular–interstitial system transferring ion fluxes may be regarded as a morphological base of a channel.[228] French scientist P. de Vernejoul et al. (1992) came to a similar conclusion after studying the migration of radioactive isotope solution introduced into acupuncture points.[229] According to Japanese researcher, P. Hashimoto (2005), the perineurium of connective tissue and perineural vessels may serve as the morphological basis of the channels.[230]

Scientists from Romania, S. Ionescu-Tirgoviste et al. (1987), measured electrical potentials in acupuncture points and concluded that the system of channels is a network of electrical conductors

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formed by interstitial tissue stretching between other known anatomical structures.[231,232] According to A. Ahn et al. (2005) that reduced resistance along a channel is due to the loose connective tissue that fills the gap between individual muscles or between muscles and bones.[189]

In 1996-1998, M. W. Ho et al. developed the theory of liquid crystal organization of living objects. According to that theory, collagen and water molecules form a liquid crystal structure that pervades the entire body. This 'crystal' is the basis of the channels. In acupuncture points, hydrated collagen fibers are perpendicular to the skin and form a passage linking the internal and the external environment. It is assumed that this aqueous collagen crystal is a semiconductor for protons. It functions as a unit and serves as the environment that ensures the existence of the cells of a multicellular organism. Dr. M. Ho considered collagen crystal to be a peripheral "body consciousness" that interacts with the "central consciousness" localized in the brain.[233-235]

According to Yu. Ignatov et al. (1990), the stimulation caused by the needle may be transmitted to a certain distance along the fibers of the connective tissue due to the ability of muscle fascia to transfer vibrations caused by its tension or perforation.[46]

H. Langevin et al. (2001) studied the phenomenon of needle retention during acupuncture treatments. It appeared that the needle retention was due to the reaction of connective tissue structures that twist and untwist around the needle rather than to a muscle spasm reaction. The force that has to be applied to remove the retained needle is more significant when the needle is in the acupuncture point than when the needle is introduced in a random skin area.[236] The studies suggested that fibrous connective tissue can conduct signals at long distances as mechanical waves propagate along the fascia covering muscles.[237]

Chinese scientists L. Yuan et al. (2004) suggested that the anatomical basis of the channel system is a branching network of fibrous connective tissue represented by various fascia.[238]

According to J. Kim et al. (2009), a channel is a subcutaneous connective tissue layer with an interstitial fluid passing through it. These channels ensure the redistribution of tissue fluid pressure between different body portions in motion. Acupuncture points are the locations for control of the redistribution of interstitial fluid.[239] P. Fung (2009) came up with a similar idea and added that mast cells and membrane calcium pumps are essential for the functioning of the channel system.[240]

3.9. The theory of channels describes interstitial clefts and bodily cavities

In 1952, doctor Rokuro Fujita, proposed the hypothesis that the channels represent a system of inter-muscular slots where interstitial fluid moves due to muscle contraction.[178,179] According to a doctor S. Takano (1985), interstitial clefts filled with a liquid with a high concentration of ions cause the "ruodoraku" phenomenon, which means high electrical conductivity of channels.[241]

In 1966, G. Kellner analyzed scores of layered skin preparations aiming to confirm or refute the results of Kim Bong Han. He found unique slots in the borderline zone between the papillary and reticular layers that made him suggest the existence of an autonomous intradermal system capable of transferring interstitial fluid and possibly responsible for the transfer of energy through the skin surface.[26]

In 1980, D. Draehmpaehi et al. studied tissue samples of four-month-old human fetuses and discovered linear subcutaneous cavities stretching in the sagittal direction of the localization corresponding to the description of the "channels." [242]

In 2003, a group of Chinese researchers analyzed the structure and function of perivascular space and suggested that the area around blood vessels could explain the phenomenon of channels and collaterals.[243] In 2008, doctor B. C. Lee et al. published an article describing the channel as longitudinal slots in subcutaneous muscles. Unlike the Kyung-Rak system, these channels have no covering membrane. They are not associated with acupuncture points, although fluid moves along these channels, like Bong Han tubes.[210]

W. B. Zhang (2008) used a special technique that permits the measurement of interstitial fluid pressure. He found areas of low pressure under the skin different from those in the surrounding tissues. These longitudinally oriented regions of low hydraulic pressure coincide with the path of the so-called "channels." Limited areas with low hydraulic resistance coincide with the points of lower

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electrical resistance. Radioactive isotope helped visualize the channel trajectory with low hydraulic resistance. A coloring agent (Alcian blue) determined a more accurate location. The speed of interstitial fluid in the channel is significantly lower than that of blood and lymph in the vessels. It is presumed that low hydraulic pressure and resistance areas belong to a previously unknown system described in the TCM.[244-246]

A study of the migration of coloring agents injected in the area of acupuncture points on the back (Bl-18, Bl-20, Bl-23) was conducted in 2009. The magnetic resonance imaging method found that the substance was not transmitted along the blood or lymph vessels but via interstitial gaps towards the direction of corresponding internal organs. [239]

3.10. Other hypotheses that explain the transmission of signals along the channels

Among the other hypotheses explaining transmission of signals along the channels is the one that assumes that the *gap junctions* participate in the process. They play an important role in the metabolic communication and in the integration of cells and tissues. It is believed that the system of gap junctions is capable of receiving and integrating information from skin surface and transmitting it to nearby and remote areas of the living organism.[127] The mechanism of signal transmission via gap junctions is working as follows: each stimulated excretes biologically active substances that stimulate neighboring cell which in turn is accompanied by mechanical vibrations. An introduced needle causes vibrating biomechanical processes that spread due to gap junctions along the chain of cells transmitting the information to the destination.[147]

Doctor S. Y. Lo (2001) suggested that channels are formed by the various polarized molecules gathered into large clusters, where water molecules play an essential role due to their permanent dipole moment.[247]

4. Modern discoveries in the functioning of channels and collaterals

This section is devoted to the research related to the specific functions of the tissue along the assumed pathways of the channels, namely:

1. The high electrical conductivity;
2. The high thermal conductivity;
3. The conducting of the electromagnetic waves;
4. The conducting of the radioactive isotopes;
5. The conducting of the contrast media;
6. The propagating of the specific sensations along the channel.

4.1. The high electrical conductivity of the channels

The most significant number of studies in channel physiology is dedicated to measuring their electrical conductivity. The resistance between the points belonging to (lying on) the same channel is lower than between the points belonging to different channels.[52,79,115,116,248,249] It is noteworthy that the conductive properties of the channels maintain their properties on the skin of cadavers and transplants.[114,115,250,251] According to F. Kracmer (1962), the electrical properties of the channels prove they have specific intermolecular bindings.[252]

Stimulation of the points of a particular channel causes a change in the conductivity of the points of the same channel.[96] For example, when the Pc-6 (*Nei Guan)* acupuncture point is stimulated, a significant decrease in the resistance to electric current is observed in the Pc-3 *(Qu Ze)* acupuncture point, which is located on the pathway of the same channel.[253]

In the experiment, bipolar electrical signals of a sine-shaped wave with a frequency of 2.5 Hz were applied to the points of the Lungs channel. It was found that the signal was transferred better in a distal direction from the point L-3 (*Tian Fu*) to the point L-11 (*Shao Shan*), that is, "in the direction of Qi flow along the channel and worse – in the opposite direction, i.e., "against Qi flow".[248]

There is an opinion that the change in the electrical activity of the channel reflects the change in the intensity of an electromagnetic field within the body,[96] blood filling of the capillaries, and the

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amount of interstitial fluid.[253] The experiments on the gel model suggested that the function of electrical conductivity of the channel is associated with interstitial fluid containing water, salt, and proteins.[254]

4.2. The high thermal conductivity of channels

Experimental and clinical work of A. Romodanov, O. Butenko, D. Liaschenko, A. Ovechkin, and other authors indicated that a thermal field spreads along the pathways of the channels. That led to the presumption that the channels represent the system of conductors of heat fields.[42,94,137,158,255]

The studies of the Chinese authors registered temperature inhomogeneity of the face with an infrared imager. It was present in the volunteers and patients with facial nerve palsy. The temperature increase along the urinary bladder channel was observed in 95 out of 444 subjects. The width of the "hot" line reached 1-1.5 cm, and the temperature gradient ranged from 0.2-0.3 to 1.5 degrees. As a general rule, the temperature gradient increased after acupuncture.[256] Acupuncture in LI-4 (*He Gu*) point caused an increase in temperature in the facial area along the projection of the colon.[257]

In another study, applying moxibustion at acupoints caused the lines of high temperature coinciding with the channel path to appear on the patient's body.[258] After a moxibustion of the point GV-4 (*Ming Men*), 70% of the volunteers noted an increase in the temperature along the midline of the back. After moxibustion of the points CV-12 (*Zhong Wan*), 56% of the volunteers had an increase in temperature along the median line of the abdomen and chest. It is assumed that the mechanism of linear propagation of the thermal field along the trajectory of the channel is associated with a change of local microcirculation or an increased thermal conductivity along a compactly organized connective tissue.[259]

Using an infrared thermal imager during acupuncture permits observing the change of temperature spreading along the projection of channels. For example, acupuncture of the point GB-37 (*Guang Ming*) in a patient with paralysis of a facial nerve caused increased temperature around the eyes. In contrast, acupuncture at the point LI-4 (*He Gu*) caused an increase in temperature around the mouth.[260] Acupuncture at the point LI- 4 (*He Gu*) caused a more pronounced temperature reaction on the face than at the point St-36 (*Zu San Li*).[261] Thus, the change of thermal fields during acupuncture further confirms the specific effect of different acupuncture points.

However, it should be noted that the distribution of the thermal field along the trajectory of the channel was not observed in all experiments.[262] This negative result may be due to the peculiarities of the subjects, which were healthy volunteers, or the moxibustion technique applied as far as no initial abnormalities were diagnosed. Acupoints were selected randomly but not according to the patient's condition, which means the experiment did not follow classic recommendations used in traditional Chinese acupuncture.

4.3. The conducting of the electromagnetic waves

In 1984, an article was published by D. F. Mandoli and W. R. Briggs dedicated to waveguide-like structures of plants capable of conducting light along the branches, the stems, and the roots.[19] Other scientists conducted similar research work.[263]

In the laboratory of V. Kaznacheev, acupuncture points were exposed to the visible light emitted by a conventional incandescent lamp. A photomultiplier tube measured the intensity of photon radiation emitted by neighboring acupuncture points. It was found that the emission intensity by points located on the same channel as the irradiated point was several hundred times higher than the background radiation detected from the points of the adjacent channels; thus, the channel's ability to conduct electromagnetic waves of the visible band was detected. It is believed that the system of channels permits the light to penetrate and reach the deepest sections of the living body.[264] The ability of the channels to conduct light was confirmed and studied by the laboratory in China.[265]

4.4. The conducting of the radioactive isotopes

The first study of *radioactive isotope* (RAI) migration after its introduction into the acupoints was conducted by a North Korean scientist, Kim Bong Han, who published his findings in 1964.[202]

In 1981, Romanian scientists Tiberiu Räibulet et al. reported the migration of isotopes in the distal direction of the limb, i.e., opposite to the proximal direction expected if the isotopes were moving through veins or lymphatic vessels.[266]

The following publications were from the French scientist P. de Vernejoul et al.[267-270] Technetium-99m [99mTc] in the form of sodium pertechnate was administered subcutaneously to a depth of 3-5 mm to a group of patients and healthy volunteers, volume of 0.05 ml containing a single dose of 10 MBq. Introduction of the RAI into the point K-7 (*Fu Liu*) located on the inside surface of the leg led to linear migration of the isotope to 30 cm from the injection site (Figure 6b). A local diffusion in different directions was observed (Figure 6a) when it was introduced outside the point.

When RAI was introduced into point St-43 (*Xian Gu*), located on the dorsum of the foot, the isotope migrated in proximal and distal directions along the tendon-muscular channel of the Stomach.[267] When RAI was administered in GB-36 (*Wai Qiu*) point located on the outer surface of the tibia and point St-41 (*Jie Xi*), located on the borderline between the foot and shin, a linear migration of the isotope in the distal and proximal directions was observed. When RAI was administered to a point LI-18 (*Fu Tu*) in the center of the sternocleidomastoid muscle, the isotope migration was observed toward the upper lip on the opposite side, i.e., alongside the Large Intestine channel.[268]

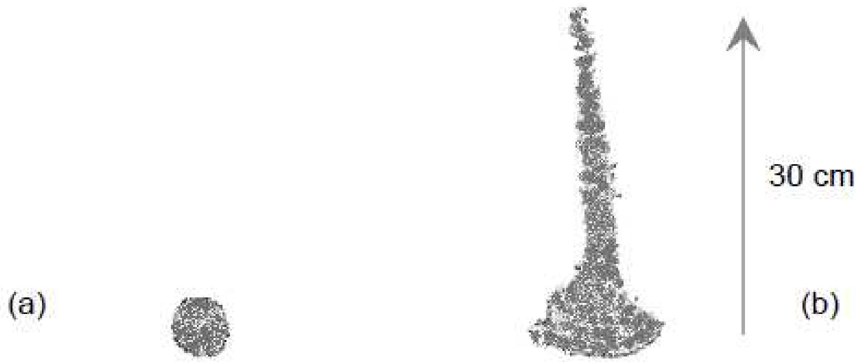

Figure 6. A modified picture presented in the article of P. de Vernejoul, et al. [267] (a) Circular diffusion of isotopes administered in a control area of the skin, (b) and a linear migration of isotope administered in the acupuncture point K-7.

When RAI was introduced into the left and the right points of the Kidney channel K-7 *(Fu Liu)* of the patients with unilateral renal pathology, it turned out that the speed of propagation of the isotope was higher on the affected side than on the unaffected one.[267]

In the subsequent experiments, RAI was administered bilaterally at the point K-7 *(Fu Liu).* Then, point K-2 (*Zhang Gu*) was exposed to impulses of the helium-neon laser. The pulse frequency of 24 Hz changed the RAI migration speed. The pulse frequency of 48 Hz caused no change in the rate of RAI migration.[268]

Pertechnetate sodium and rhenium sulfide labeled by technetium isotope [99mTc] were used to exclude migration of the isotope via (or through) the lymphatic system. Iisotopes were administered to the acupuncture points or into the webbing between the toes according to the classical method of lymphography. After introducing rhenium sulfide into the webbing between the toes, it was accumulated in the lymph node. However, no RAI accumulation in the lymph nodes was observed when sodium pertechnetate and sulfur rhenium were administered at the acupuncture point. The assumption of the distribution of RAI by veins was also excluded, as the isotope migration went on in a longitudinal direction (not in the transverse direction typical for the location of the veins on the back of the foot.[267,269,270]

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The average speed of RAI linear migration did not exceed 3-5cm/minute, i.e., it was significantly lower than in the case of migration along the veins or lymph vessels. Thus, apart from the typical trajectory of the isotope propagation, there was another essential peculiarity of the isotope migration: a slow onset of the migration and a slow disappearance, unlike rapid onset and disappearance in the case of isotope migration along lymphatic or venous vessels.[268] It is believed that RAI migrates along areolar connective tissue surrounding neurovascular bundles.[268]

The Spanish scientists of F. M. Kovacs's laboratory performed similar studies on dogs. In the first experiments, radioactive technetium (99mTc) was administered subcutaneously at a low electrical resistance point on the dog's paw; after that, the linear isotope migration (LIM) was observed in the proximal direction as a narrow line. The isotope propagated along the same line in different experiments with an average 2cm/minute speed. The isotope distribution was not associated with the movement along nerves, blood, or lymph vessels.[271]

Further experiments clarified that the migration of radioactive technetium is possible only in case of skin integrity both in the path of the migration and on the opposite extremity.[272]

If a skin incision is made in the path of the radioactive isotope, the migration continues around the wound. After stitching the wound, LIM was restored, and the isotope ceased moving around the wound. LIM was also restored if an unstitched wound was filled with silicone gel or a gel for ultrasound diagnostics and was covered with a solid silicone sheet parallel to the skin surface. LIM was absent if the wound remained unstitched but was filled with Vaseline or a whole silicone layer. Thus, the LIM process was observed even before restoring the integrity of the traumatized tissue. The experimental results suggest that the mechanism of linear isotope migration is similar to the capillary electrophoresis.[273]

Despite the obvious character of the above results, some authors are still arguing that the leading role in the process of elimination of the radioactive isotope is not played by the "channels," but rather by the well-known venous and lymphatic vessels.[274,275]

4.5. The conducting of the contrast media

Studies with non-radioactive contrast agents administered at the points of different channels were also conducted. According to MRI, the migration of contrast matter was linear along the trajectory of the channels. It was also noted that the transfer of the contrast matter was not related to the movement of the blood or lymph among the vessels. Linear movement of the contrast matter was not observed when it was administered outside the acupuncture points.[276]

Similar results were demonstrated by J. Kim et al. (2009) in their studies of colorant migration when administered to the dorsal acupuncture points (Bl-18, Bl-20, Bl-23). According to MRI, the substance was transferred neither by the blood or lymphatic vessels but via interstitial gaps in the direction of the respective internal organs.[239]

The studies of W. B. Zhang (2008) detected longitudinal regions of lower pressure in the subcutaneous areas of guinea pigs. The speed of interstitial fluid through these lower pressure channels was significantly lower than that of blood and lymph within vessels.[245]

Solutions of medications introduced into points with low flow resistance are eliminated from the area of the points much faster than when administered to control skin areas. Rapid absorption of the medication means a quicker onset of the pharmacological effect.[277]

6. The propagating of the specific sensations along the channel

Phenomenon of "Arrival of Qi" (De Qi) was described from the very beginning of acupuncture. If the needle is inserted to the desired depth, the patient may feel aching, distension, tingling and other sensory modalities in the area of acupoint. In this case you may find the changes of biophysical parameters of skin around the needle. In the ancient book Spiritual Pivot (*Huangdi Neijing Lingshu*), it was written that "acupuncture therapy does not take effect until arrival of Qi". Later they noticed, that quick arrival of Qi suggested good effects in treatment, slow arrival of Qi retarded effects in treatment. If there is no needling reactions, doctor should concentrate his mind, insert needle to a certain depth, apply special manipulation and wait for Qi, which "seems a fish bites on fishing pulling the line downward".[278]

Special needle manipulation causes the sensations that propagate along the limbs and the body. This phenomenon is called "propagated sensations along the channels" or PSC. The phenomenon of the "arrival of Qi at the site of disease" or AQSD is similar. With it, the positive clinical effect develops as the sensory responses extend to a place of the conventional localization of the pathological process or pain.[279-281] There are manifesting PSCs when a patient is describing some sensations accompanied by the change of objective parameters of the points and relevant bodies, and the latent ones when it is possible to detect a change of objective parameters in the area of the points and/or organs despite the absence of sensory reactions.[280,281]

According to the experts in acupuncture the presence of PSC is one of the proofs supporting the existence of morphological – functional system referred to as channels or meridians. Registration of the directions and the development of the sensations when acupuncture points are activated permits to further verify the paths of the meridians.[282-284]

The research permitted the measure of the sensations' propagation speed, which varies on average between 1.5 and 5.0 centimeters per second, but sometimes reaches 20 cm/second. The width of the strips of skin within which the sensations are experienced ranges from one to three centimeters on the limbs and up to 10 centimeters on the body.[44,96]

Objective physiological changes are detected in the presence of sensory reactions that can be measured by a variety of devices, such as:

- An increase in the amplitude of the systolic wave of the vascular rheo-angiogram located in the area of the stomach meridian with the stimulation of the point St-36 (Zu San Li).
- Increase in heart rate during stimulation of the Pericardium channel points;
- An increase in urine output during stimulation of the Kidney channel points.
- An increase in the excretion of cAMP upon stimulation of the Urinary Bladder channel.

These changes ceased shortly after the stimulation is over and PSC is withdrawn, and they do not occur when the points of the other meridians are activated. In the absence of PSC, physiological changes were not recorded or were expressed very weakly.[285]

In other studies, the proliferation of the PSC, caused by the needle stimulation, was accompanied by a change of skin color as a red stripe (vasodilatation) or as a white stripe (vasoconstriction).[279]

Stimulating the end (Jing) points of channels caused 2-15 Hz sound signals with triangle or sine waves propagating along the channel.[279] The other phenomena included the change in the electrical resistance and capacity in the points, increased pain threshold, and increased activity of the spontaneous visible light.[279] Upon reaching the PSC of the relevant body, it changed its physiological parameters, and in particular, there was an increase in myocardial contractility, louder rumbling in the stomach, and activation of peristaltic motion.[279-281] In this case, specific sensations reached the area of the disease, the pain was eased, asthma attacks stopped, or a muscle spasm was relieved. Persistent clinical effect was achieved by the courses of treatment of chronic diseases, including myopia, gastroptosis, optic nerve atrophy, ischemic heart disease, and others.[280]

The studies on the blockade of sensations propagating along a channel are of great interest. It was proven that the PSC and therapeutic effects may be blocked by cold exposure of the area of the channel projection. [96,279] On the contrary, local warming of the channel speeds up the transmission of PSC.[279,280] On the contrary, local warming of the channel speeds up the transmission of PSC.[279,280] The PSC blockade effect may also be achieved by injecting 0.2-0.3% saline or lidocaine solution into deep tissue and after either epidural or peridural anesthesia. However, intrathecal and epidural anesthesia could not blockade the sensation propagating along a channel in some patients.[280]

A mechanical pressure of 500 - 1000 - 500 g/mm^2 with a tissue deformation in the channel projection region immediately blocks PSC. The critical factors for PSC blockade are the localization and the force of pressure of pressure. Thus, a light touch to the skin without pressure and the pressure outside the channel projection area do not cause PSC blockade and, therefore, do not reduce the effect of acupuncture treatment.[279,280,286] PSC blockade neutralizes all of the above effects of PSC, including the pain relieving effect of acupuncture.[96]

In the middle of the 1980s, E. Andreev, S. Sit'ko, et al. carried out studies with low-intensity electromagnetic radiation (EMR) in millimeter (MM) range. Therapeutic frequency was chosen for each patient individually, considering the patient's body's PSC and objective parameters. They called their methods "microwave resonance therapy".[153,199,200] They were the first to describe the effect of the PSC blockade by constant magnetic field. This phenomenon was called "the phenomenon of Rudenko".[287,288]

In 1989, as part of a state program carried out under the supervision of the USSR Academy of Sciences to study the biological and medical effects of EMR MM, a series of experiments on the stimulation of sensory reactions with subsequent blockade by a constant magnetic field was carried out. It was found that the patient’s sensory reactions were accompanied by a change in temperature at particular acupoints located on the channels. When the permanent magnet with a magnetic field strength of 500 *oersted* was placed on one of the points along the channel, the sensory reactions previously stimulated by EMR MM were gone, and the temperature at the points went back to the initial one.[289]

Summarizing the review of research on the PSC phenomenon, one can say that most authors who studied the PSC phenomenon concluded that the PSC blockage was not due to the signal interferences at specific parts of the central nervous system but instead due to the blockage of some process at the periphery. Therefore, the PSC phenomenon is associated with an unknown physiological process developing and propagating directly along a channel.[280,286]

5. The "channels and collaterals" theory describes the physiology and pathology of intercellular space

In 1989, after analyzing the literature on acupuncture points and channels, and considering the results of the therapeutic application of the EMR MM range, it was suggested that the channels are interstitial gaps.[290]

After further discussion, attention was drawn to modern research methodology that usually suggests the connections of specific functions to specific structures of a biological object. However, in some cases, the absence of a structure provides an additional conductive function, for example, a window or door opening, a riverbed or drainage system, etc. Thus, the channels can be represented as gaps stretching between the other well-known anatomical structures. Surfaces of muscles, blood vessels, nerves, bones, and other structures also form the outer walls of the so-called channels. These gaps are filled with longitudinally oriented fibrous connective tissue, ground substance, electrolyte solutions, and structured water. Perhaps, this is enough to ensure the Qi conductivity function. This interpretation of the channels corresponds to the functional and morphological data discussed above and to the description of the channels in the writings of the Chinese master Li Shi Zhen: "... *there are tunnels within a body and the one turning his mental gaze there may illuminate them* ..." [162]

The theory and the experimental data proven that direct intercellular information exchange is carried out with the participation of electromagnetic fields of the frequency ranging from 10^{11} to 10^{14} Hz.[264,291] According to radio physics, such frequencies are transmitted by dielectric waveguides. Nerve fibers are suitable transmitters of low-frequency signals, whereas high-frequency signals may be transmitted only through the channels serving as a waveguiding structure. Therefore, the system of channels is the leading candidate for transmitting high-frequency signals generated by the cells. Theoretical and experimental studies confirm that the channels can be waveguides transmitting electromagnetic waves of various ranges.[19,264,287,291]

The channels likely are an independent and the most ancient (in phylogenetic and ontogenetic sense) regulatory system of the body. However, being the basic one, it unites all other more

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sophisticated and the younger systems of macro-organism and provides interaction of the bodily interior with the environment.[107,201,292]

For the above reason, in 2003, the hypothesis was first proposed that physicians of ancient China designed the theory of channels and collaterals to describe the physiology and pathology of intercellular space, gaps, and cavities of the human body.[62,293] (Figure 7)

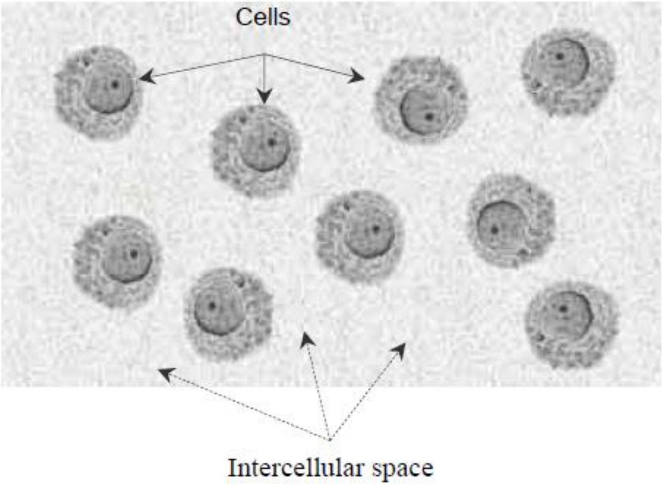

Figure 7. Theory of channels and collaterals describes physiology and pathology of intracellular space

Analyses of the channel trajectory may prompt us to find a correlation between the channels and specific anatomical structures, but the relationship will be functional rather than morphological. The nature of the disease and its effects may help to determine the relationship of a specific disease with a particular regular channel or its secondary vessel.

For example, skin and subcutaneous tissue inflammation accompanied by redness, swelling, increased local sensitivity, and temperature may serve to diagnose the excess syndrome of the tendon-muscular channel passing through the affected area. Suppose there is a contraction of a specific group of muscles or tendons, or a keloid scar or non-healing wound persists after recovery; in that case, one can suggest the involvement of Luo-channel (collateral) in that affliction. If there are general manifestations of the disease with the signs of general adaptation syndrome and symptoms of the organs, it signifies the presence of the pathology of the regular channel and perhaps an organ.[294]

However, if we analyze the pathway of the Governing Vessel and the Conception Vessel, we can conclude that the first one corresponds to the spinal canal and cranial cavity, and the second one corresponds to the thoracic and abdominal cavities.[62]

6. The theory of Organs describes the physiology and pathology of cells

TCM identifies 12 main organs. There are six organs classified as Yin, or solid organs with parenchyma inside (Lungs, Spleen-Pancreas, Heart, Kidneys, Pericardium, Liver), and there are six organs classified as Yang, or hollow organs with internal cavities (Large and Small Intestines, Stomach, Gall bladder, Urinary bladder, and Triple heater).

Solid and hollow organs combined in pairs. There are small cavities inside the solid organs, for example, bronchi in the lungs, pyelocaliceal system in the kidneys, pancreatic ducts in the pancreas, bile ducts in the liver, etc., which resemble hollow organs. The hollow bodies are surrounded by parenchymal walls which can be attributed to a solid organ. Therefore, a stone in a kidney is located in the Urinary bladder, and a peptic ulcer located in the Stomach is a manifestation of the pathology of the Spleen-Pancreas.[62]

The term "organ" in TCM has a broader meaning than in anatomical formation. Most cells have standard organelles such as the nucleus, Golgi apparatus, endoplasmic reticulum, mitochondria, etc. Each organelle is responsible for specific functions. Mitochondria are responsible for oxidizingphosphorylation and ATP synthesis. Golgi apparatus synthesizes proteins, polysaccharides, and other complex molecules and accumulates various minerals and biologically active substances. The cell nucleus is responsible for the development, constant shape, and death of the cell.

The essential functions of the main organs may be localized in specific organelles of every cell; for example, mitochondria are in charge of breathing (~ lungs), the endoplasmic reticulum is responsible for digestion and nutrient transportation (~ pancreas); the Golgi apparatus is responsible for the accumulation of biologically active molecules (~ liver); the cell nucleus maintains homeostasis and is in charge of development and death (~ kidney). The centrioles play an essential role in the process of cell division. Microtubule pulsing discovered in centrioles suggests that centrioles are most likely the intracellular analogs of the heart.[295] (Figure 8)

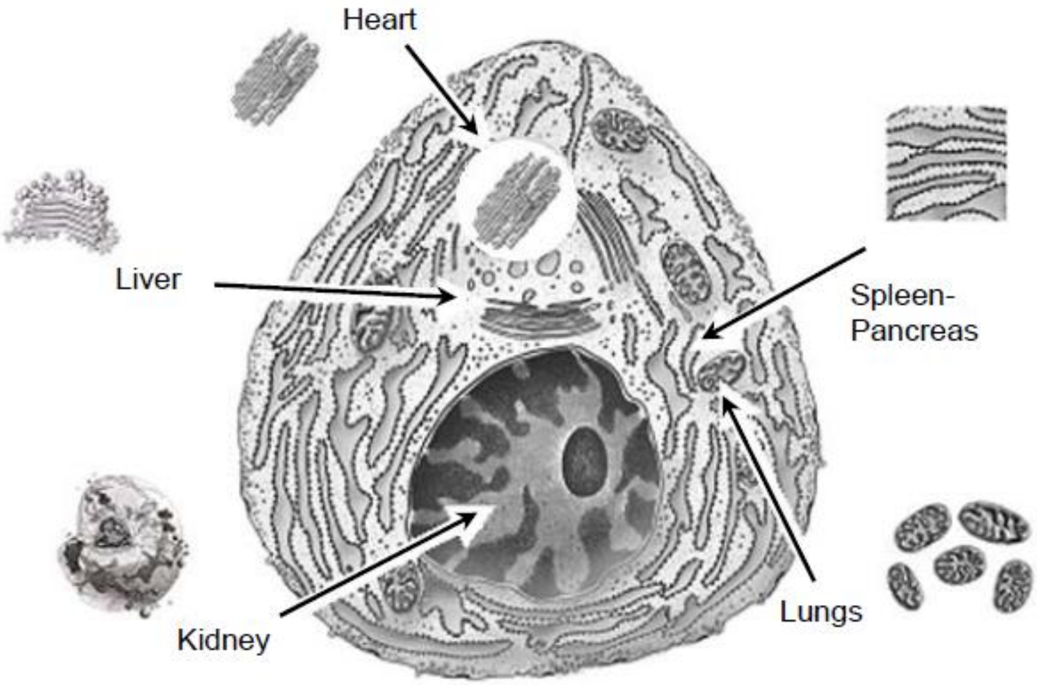

Figure 8. Cell and organelles: Golgi complex corresponds to the Liver, Mitochondria – to the Lungs, the Nucleus – to the Kidneys, Endo-plasmatic reticulum – to the Spleen-Pancreas, Centrioles could correspond to the Heart.

All said above suggests that the TCM concepts of the organs are related to certain features and pathological processes in the human body's cells.[62] For example, the term Lungs stands for the system of organs and tissues responsible for synthesizing Qi, or energy accumulated in ATP molecules. This system includes a respiratory center that regulates the complete process of respiration: the Lungs, which are involved in external breathing, red blood cells transport gases, and mitochondria perform ATP synthesis. (Figure 9)

Essentially, this complex circuit converts the energy stored in food into energy stored in the binding between the ribose molecule and phosphoric acid molecule. Therefore, whenever dyspnea is present, it is necessary to work with the points of the Lung channel regardless of the etiology, pathogenesis, and true localization of the disease. Inspiratory dyspnea and cough that aggravates at exhalation indicate the syndrome of lung deficiency and require activation of the relevant points. Expiratory dyspnea and cough that aggravates at inspiration indicate the syndrome of lung excess and require sedation of the relevant points.[62]

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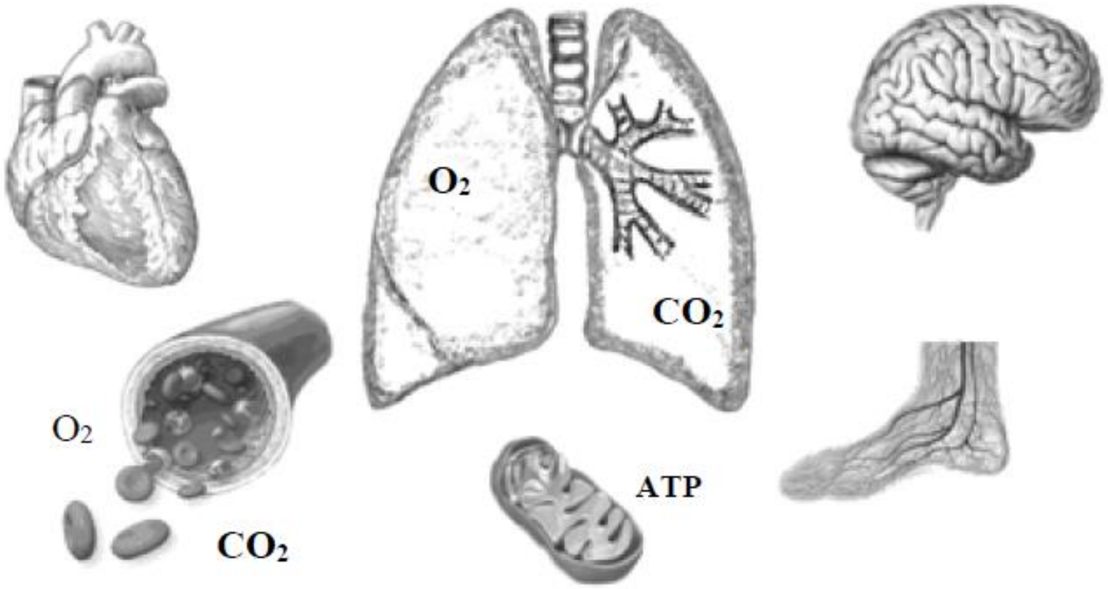

Figure 9. A system of "Lungs" provides the function of the external breath, transportation of oxygen and carbon dioxide and finally tissue respiration with subsequent synthesis of ATP molecules.

In the same way, all other main organs have their essential functions and specific symptoms. For example, headache and dizziness points to a disease of the 'Liver,' insomnia and poor memory point to a disease of the 'Heart,' digestive problems point to a disease of the 'Pancreas,' and so on.[96]

Conclusion

Thus, according to the acupuncture theory of TCM, Qi, and blood circulates in the human body along the "channels and collaterals". For several thousand years, this theory allowed for effective treatment using classical acupuncture and moxibustion. From the time of acupuncture was designed to today, man has not changed. Consequently, the "channel system" described in ancient times is present in the human body today. However, analyzing all the above material, it is impossible to find confirmation that some kind of specialized regulatory system is still unknown in modern anatomy or physiology. Based on this, we can conclude that a "channel system" must exist, and perhaps it is known in modern biology and medicine. However, its description in scientific terms makes it difficult to recognize the system described as a "channels and collaterals." Taking this into account, one can propose that, by the theory of channels and collaterals, doctors of ancient China described the physiology and pathology of the intercellular space and cavities of the body, and by the theory of internal organs they described the physiology and pathology of the cells.

Depending on the nature of the disease and its consequences, it may refer to channels (intercellular space), which are superficial and less dangerous, or to organs (cells), which are deeper and more dangerous.

In turn, depending on the nature of the disease and its consequences, it may refer to regular channels, which are deeper, or to the secondary vessels or collaterals, which are more superficial and less dangerous.

The term "organ" can refer to a specific function inherent in all cells, or to a specific organ that provides a particular function. It also can unite a system of organs involved in the joint implementation of a complex function. In the latter case, the term "organ" describes a "functional system," the unifying factor of which is the valuable result of the action.[296]

Analyzing theories used in TCM, one may believe they are a basic mathematical model, showing the general laws and relationship between physiological and pathological processes in the human organism. Although modern analogs can be found for the majority of terms and theories of TCM, it is essential to avoid simplifying ancient knowledge but to study it carefully to use it for scientific research and daily practice.[297]

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Abbreviations

TCM, Traditional Chinese Medicine; ATP, adenosine triphosphate; BAP, biologically active point; BAPs, biologically active points; EP, electrical potentials; AP, action potential; RAI, radioactive isotope; LIM, linear isotope migration; PSC, propagated sensations along the Channels; EMR, electromagnetic radiation.

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PS 05

NANO-ORGANOTHERAPY: PRECISION MEDICINE WITH ORGAN-SPECIFIC NANO-PEPTIDES

Dr. Mikhail Teppone

Medical Department Nano City Holdings Berhad Shah Alam, Malaysia
E-mail: mikhail.teppone@gmail.com

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Original Article

History of advances in genetic engineering of viruses before COVID-19 pandemic

Mikhail Teppone

Medical Department, Nano City Holdings Berhad, Shah Alam, Malaysia.

E-mail: *Mikhail Teppone - mikhail.teppone@gmail.com

***Corresponding author:**
Mikhail Teppone,
Medical Department, Nano City Holdings Berhad, No. 1, Jalan Sungai Jeluh 32/192, Shah Alam, 40460, Selangor, Malaysia.

mikhail.teppone@gmail.com

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ABSTRACT

Background: On December 31, 2019, the World Health Organization's China Country Office was alerted to cases of pneumonia of unknown cause detected in Wuhan City, Hubei Province of China.

Methods: Due to the fact that to date, the question of the origin of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has not been resolved yet, the author analyzed the main advances in the development of genetic engineering of viruses that took place before the onset of the COVID-19 pandemic.

Results: The first artificial genetically modified viruses could appear in nature in the mid-1950s. The technique of nucleic acid hybridization was developed by the end-1960s. In the late 1970s, a method called the "reverse genetics" emerged to synthesize ribonucleic acid and deoxyribonucleic acid molecules. In the early 1980-s, it became possible to combine the genes of different viruses and insert the genes of one virus into the genome of another virus. Since that time, the production of vector vaccines began. At present, by modern technologies one can assemble any virus based on the nucleotide sequence available in the virus database or designed by a computer as a virtual model.

Conclusion: Scientists around the world are invited to answer the call of Neil Harrison and Jeffrey Sachs of Columbia University, for a thorough and independent investigation into the origin of SARS-CoV-2. Only a full understanding of the origin of the new virus can minimize the likelihood of a similar pandemic in the future.

Keywords: Chimeric virus, Genetic engineering, Reassortant virus, Recombinant virus, Reverse genetic, SARS-CoV-2

INTRODUCTION

On December 31, 2019, the World Health Organization's China Country Office was alerted to cases of pneumonia of unknown cause detected in Wuhan City, Hubei Province of China.[41] On January 21, 2020, Sather tweeted that the coronavirus that caused the epidemic in China was patented back in 2018.[49] Presumably he meant a patent describing an attenuated version of the coronavirus, which can be used as a vaccine for the treatment and prevention of coronavirus infection.[1] Sather also recalled that in early 2019, the World Health Organization (WHO) named vaccine hesitancy as one of the top ten threats to global health. As it is known, *Ten threats to global health in 2019* was issued in the middle of January 2019,[60] and immediately caused an active discussion.[4,16,62,63] On September 12, 2019, the WHO organized the Global Vaccine

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Summit, which discussed three important topics, namely: "In Vaccines we trust," "The Magic of Science" and "Vaccines Protecting Everyone, Everywhere."[17] At the same time, workshops were held with some media and social networks in regard to the censorship of the content of publications. In particular, it was recommended to limit discussions on the topics related to the effectiveness of natural immunity and natural treatments, as well as the necessity and effectiveness of vaccination and its side effects.[34] Sather then asked questions whether the new disease was planned, whether it will be a way to raise money through the BigPharma system, whether the mass media are used to instill fear around a new disease, etc.[49]

On January 23, 2020, several events took place that played an important role in the subsequent development of the pandemic. On this day, a historic session on the Coronavirus was held at the World Economic Forum in Davos. The keynote speakers were Jeremy Farrar, a director of the Wellcome Trust, Richard Hatchett, a director of the Coalition for Epidemic Preparedness Innovation, and Stefan Bancel, a director of Moderna, Inc., an American pharmaceutical and biotechnology company. It has been suggested that at the heart of the fight against the impending threat should be the restriction of movement and the vaccination of people with a new messenger ribonucleic acid (RNA)vaccine that can be developed and tested in a very short time.[67] On the same day two articles were published regarding the pandemic: In the first article, a panel of experts, with the participation of the director of the US National Institute of Allergy and Infectious Diseases, Fauci *et al*., expressed the opinion that coronavirus infection is much more dangerous than the common cold,[40] and another article suggested a polymerase chain reaction test to detect a new coronavirus (2019-nCoV) patients.[9] Furthermore, on January 23, 2020, humanity suffered an irreparable loss - the sudden death of Peter Salama, epidemiology expert, former director of the WHO Health Emergencies Program, who organized the successful fight against the Ebola virus in the Democratic Republic of the Congo.[66]

Since that time, some media began to discuss the origin of the new virus, including the assumption of a virus leak from a bio-laboratory or even of a biological warfare.[39]

On January 31, 2020, an article "Unique inserts in the 2019-nCoV spike protein"[42] was published followed by another one "Reduction and functional exhaustion of T-Cells."[13] These discoveries demonstrated structural and functional similarities between two viruses and prompted a common sense question about the origin of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

On February 5, 2020, the VESTI.RU published a brief overview of the researches dealing with the achievements in genetic engineering of viruses over the past 20 years. Among them were: A mousepox virus constructed in Australia (2001); a poliovirus synthesized in the USA (2002); a "Spanish Flu" virus recovered and modified by the experts from the USA and Japan (2005–2008); an airborne avian influenza virus synthesized in the Netherlands (2011); a recombinant coronavirus, which poses an epidemic danger to humans, created by scientists from the USA, China and Switzerland (2015); a horsepox virus (HPXV) reconstructed by scientists from the USA and Canada (2018), etc.[52]

Confirmation of the possibility to obtain a new virus in the laboratory was the assembling of a synthetic coronavirus in a Swiss laboratory in February 2020. For the synthesis the scientists used a nucleotides sequence in the viral genome published by Chinese authors.[61]

The version of the artificial origin of SARS-CoV-2 was supported by the Nobel laureate in Physiology or Medicine in 2003, Luc Montagnier, who was well acquainted with the achievements of the genetic engineering of viruses. According to Montagnier, the new virus was a side effect of research to develop a vaccine to prevent human immunodeficiency virus (HIV) infection.[44] Presumably, several genes important for the formation of immunity against HIV were inserted into the genome of the coronavirus. It only remained to weaken the virulence of a new virus and the vector vaccine against HIV infection would be ready.

Supporters of the natural origin of the new virus were in the majority. Among them, one can find many experts from all over the world who claimed that nowadays it was impossible to create a virus like SARS-CoV-2 in the laboratory. In March 2020, around 30 scientists published an article in the Lancet, which stated the following: "We stand together to strongly condemn conspiracy theories suggesting that COVID-19 does not have a natural origin. Scientists from multiple countries have published and analyzed genomes of the causative agent, SARS-CoV-2, and they overwhelmingly conclude that this coronavirus originated in wildlife."[3]

On April 18, 2020, Yuan Zhiming, a director of the Wuhan Institute of Virology, declared: "From my personal understanding of virology, there is no evidence to prove that the virus has artificial or synthetic traces. Besides, some scientists believe that to synthesize a virus requires extraordinary intelligence and work load. So I have never believed that we humans would have the capability at this time to synthesize such a virus."[10]

A detailed and balanced analysis of the possible origins of the new virus was published in July 2020. In this study, Sousa concluded that "The various genetic peculiarities discovered in SARS-CoV-2 can be explained naturally. However, as the number of abnormalities causing some gain of function increases... the statistical chances of such an event occurring decrease randomly in nature."[57]

Questions about the origins of the virus resurfaced in December 2020 when production of an Australian vaccine was discontinued as healthy vaccinated people became tested positive for HIV.[11]

MATERIALS AND METHODS

Due to the fact that to date, the question of the origin of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has not been resolved yet, the author analyzed the main advances in the development of genetic engineering of viruses that took place before the onset of the COVID-19 pandemic.

The objective of this article is to study the main phases in the development of technologies used in the genetic engineering of viruses from isolation of the first virus in 1935 to the emergence of the COVID-19 pandemic.

RESULTS

The initial phase of research on the modification of the viruses

After the isolation of the tobacco mosaic virus, the study of the structure of viruses, as well as the determination of the role of proteins and nucleic acids in the infectious process began. Regular research into virus breakdown and reconstitution started in the mid-1950s. The book "Viruses" published in 1959 had a section devoted to the chemical basis of the infectivity of viruses. The chapter *Reconstitution of viruses from different strains* includes several topics, namely: *Mixed viruses*; *Mixed nucleic acid viruses*; *Search for in vitro-produced mutants*, etc. On the page 453 one can read the following: "Since it has become possible to demonstrate infectivity in degraded and reconstituted virus preparations, the aim has been to produce at will a new genetic (i.e., replicating) species of molecules."[15]

Viruses were exposed to either chemical or physical agents, which led to a change in their genotype and phenotype. An important aspect of such research was the isolation and study of parts of the viral genome that played a leading role in the process of infection and disease development.[53] Studies on the creation of pathogenic viruses using adaptive influence still continue in present time.[30]

Technologies used for nucleic acid synthesis and modification as well as nucleotide sequencing

The technique of nucleic acid hybridization was developed by the mid-1960s.[54] In the late 1960s, it became possible to insert deoxyribonucleic acid (DNA) fragments of viruses into the DNA molecules of animal cells.[47] Then, a technology was developed to connect the ends of DNA molecules belonging to different viruses and bacteria; circular structures were constructed, consisting of the DNA of the simian virus 40 (SV40), the DNA segment of the lambda phage gene, and the DNA segment of the bacterium *Escherichia coli*.[26] Approximately at the same time, experiments were carried out on the extracellular synthesis of nucleic acid molecules.[28] In 1976, a hybrid virus was constructed in which a segment of the DNA molecule of the lambda phage was inserted in place of the deleted part of the DNA of the SV40 genome.[18]

By 1978, a technique was developed to control the change in the genome of the virus, called the method of "reverse genetics." The ribonucleic acid (RNA) molecule to be replicated was used as a template, on which a DNA molecule was built with the help of the enzyme called reverse transcriptase. Then, the newly created DNA molecule was used as a template for constructing RNA molecules identical to the primary experimental molecule. At this stage of the synthesis, the enzyme DNA dependent RNA polymerase was used.[58]

In 2002, at the State University of New York, a template in the form of a DNA molecule was assembled from synthetic oligonucleotides, and then a full-sized infectious neurovirulent poliovirus was *de novo* synthesized; it was capable of paralyzing and killing mice. The nucleotide sequence of the viral genome was taken from a database available on the Internet, and the necessary synthetic oligonucleotides were purchased through a chemical sales network. This experiment proved the possibility of synthesizing an infectious pathogen by biochemical means *in vitro*, having only a description of the genome and synthetic nucleotides.[5]

In 2003, a report was made on a new technique that allows the rapid assembly of a synthetic DNA molecule with a size of 5–6 Kb. As confirmation of this, the complete infectious genome of bacteriophage X174, consisting of 5386 nucleotides, was assembled, for which chemically synthesized oligonucleotides were used. The infectivity of synthetic DNA was lower than that of a natural DNA, indicating approximately 10 errors per molecule.[55]

The creation of new bacterial and viral genomes was accompanied by the emergence of methods for determining the nucleotide sequence, that is, sequencing of DNA and RNA molecules.[2,33,48]

Construction of reassortant viruses and production of vector vaccines

By the beginning of 1980s, genetic engineering had developed a technology (*gene splicing*), that allows inserting a selected gene of one virus into a desired position in the genome of another virus, and then analyzing the phenotype of a new object. For example, one of the features of the epidemic rotavirus that causes diarrhea in humans is the difficulty of cultivation in tissue culture. After replacing several growth-limiting genes with cultured bovine rotavirus genes, a reassortant human rotavirus became capable of growing in tissue culture. This study was completed and a manuscript was sent to the editor of the Proceedings of the National Academy of Sciences of the United States of America on September 5, 1980.[19]

In 1982, the results of constructing and studying the characteristics of the new reassortant poxviruses were published. Panicali and Paoletti wrote: "We have constructed recombinant vaccinia viruses containing the thymidine kinase gene from herpes simplex virus. The gene was inserted into the genome of a variant of vaccinia virus that had undergone spontaneous deletion as well as into the 120-megadalton genome of the large prototypic vaccinia variant"[36]

Newly constructed reassortant viruses were now used for the production of a new type of vaccines. For example, Paoletti *et al*. published results of their study: "The technique involves translocating a particular gene from an infectious agent into the genetic material of the smallpox vaccine virus. This unique foreign gene, selected because it contains the information essential for the synthesis of an antigen important in immunity to that particular infectious disease agent, is now expressed under the regulation of the engineered smallpox vaccine virus. On immunization with this live recombinant vaccine, the body is fooled into thinking that it was infected by the foreign infectious disease agent and mounts a defensive attack resulting in immunity to that particular infectious agent."[38] It is further reported that smallpox vaccine viruses were engineered to express genes encoding either the hepatitis B virus surface antigen, or the herpes simplex virus glycoprotein D, or the hemagglutinin from influenza virus. This study was completed and published in September 1984.[38]

Vaccines made with application of a genetically modified non-infectious virus, into the genome of which genes taken from the infectious virus against which the preventive action is directed, were called "vector vaccines."[21]

Thus, any vector vaccine is the result of research on creation and production of a new genetically modified reassortant virus. One can assume that the construction of viruses similar to SARS-CoV-2 became possible around the border of 1980s and 1990s.

The rescue of the Spanish flu virus that caused a pandemic in 1918–1920

In 1995, a team of experts from the Armed Forces Institute of Pathology (a U.S. government institution) began research to isolate the virus that caused the Spanish Flu pandemic. In 2005, scientists concluded that it was an avian non-reassortant virus that had adapted to humans.[59] The Spanish Flu virus was rescued by reverse genetics technique, and after the final manipulations, the deadly virus became human-specific.[64]

During the study of the certain parts of the Spanish Flu virus genome, specific gens were identified that could be responsible for high virulence and mortality. Then the construction of new reassortant viruses as well as testing their virulence began. In particular, recombinant viruses were generated in which the genes of the 1918 virus were replaced by genes from the modern human influenza virus H1N1, as well as recombinant viruses, in which the genes of the modern human influenza virus were replaced by genes of the 1918 virus.[37,65] It was assumed that understanding the virulence factors of future pandemic viruses would help to develop effective antiviral drugs that can prevent or stop a future pandemic.

Continued work on the construction of the new reassortant viruses

Studies with potentially dangerous viruses included modification of genotype and phenotype among flaviviruses, poxviruses, orthomyxoviruses, coronaviruses, and others.

In 1999, scientists created a reassortant flavivirus in which the genes encoding two structural proteins of the Japanese encephalitis virus were inserted into the genome of the yellow fever virus. The new viruses grew in vertebrate or mosquito cells as well as their predecessors, although they did not share common mosquito vectors and reservoirs among vertebrates, and they differed in the clinical syndromes they caused.[6]

In 2001, a reassortant mousepox virus was constructed, into the genome of which the herpes simplex virus gene was inserted. In genetically resistant mice infected with the modified virus, there was an increase in the production of interleukin-4 and suppression of the cytolytic response of natural killers and cytotoxic T-lymphocytes. The fulminant mousepox with high mortality occurred even in the case of preliminary vaccination.[27]

Research on the creation of reassortant influenza viruses was not limited to work with the Spanish Flu only, but also spread to other strains. In particular, a 2008 publication states: "...we used reverse genetics to generate the 63 possible virus reassortants derived from H5N1 and H3N2 viruses, containing the H5N1 surface protein genes." Of the 63 reassortants, 13 posed the greatest threat to mammalian hosts. "...one of the most pathogenic reassortants contained avian PB1, resembling the 1957 and 1968 pandemic viruses."[8]

In September 2011, the 4th Conference of the European Scientific Working Group on Influenza was held in Malta, where a number of reports were presented describing the creation of genetically modified viruses with enhanced or weakened pathogenic functions.

One of the reports was titled: *Why is HPAI H5N1 virus not transmissible via aerosol? An extensive mutational and phenotypic analysis of mutant and reassortant H5N1 viruses*. The Methods section says: "We introduced several known adaptation mutations and exchanged several gene segments in an attempt to adapt HPAI H5N1 virus for efficient replication and possibly transmission in mammals."[22]

Another report of the conference was devoted to the construction *in vitro* of reassortant viruses resistant to the Oseltamivir (Tamiflu). They were obtained by coinfection of Madin-Darby canine kidney cells with influenza viruses belonged to the resistant and susceptible to the Oseltamivir strains.[51]

At the conference there were presented the results of animal experiments in which spontaneous mixing occurred between wild-type influenza viruses and live viruses of the attenuated strain used for the vaccine. As it turned out, the new reassortants were not more dangerous than wild-type parents.[29] It was also reported that a new reassortant virus was found in one of the patients; it included genes from seasonal and pandemic influenza viruses, but this natural reassortant did not pose a pandemic risk.[56] Based on the results of these studies, it can be assumed that the occurrence in nature of reassortant viruses that could cause a pandemic is not a common issue.

In a study sent to the *Nature* in June 2015, and published in November 2015, scientists from the United States, China, and Switzerland explored the directions of possible mutations of the bat coronavirus, in which a relatively harmless virus would acquire new properties and be able to cause a pandemic in humans. Using the method of reverse genetics, a gene expressing the spike of the bat coronavirus SHC014 was introduced into the genome of the SARS-CoV virus. A new reassortant virus had the ability to effectively bind to angiotensin-converting enzyme 2, a receptor located on the cell membrane of various human tissues, as well as multiply in respiratory tract cells and achieve *in vitro* titers equivalent to epidemic strains of SARS-CoV. In addition, the resistance of the virus to the therapeutic and prophylactic drugs used to treat SARS was revealed. Based on their research, the authors expressed concern that the coronavirus could be the cause of a future pandemic.[32]

In 2018, Canadian and American scientists recreated the HPXV. Ten large DNA fragments of 10–30 Kb each were synthesized based on the nucleotides sequence of HPXV, and then they were assembled together, removing excess sections. The synthesized virus was less virulent in mice than modern vaccinia virus, yet it provided vaccine protection against lethal infection with the natural virus.[35]

In October 2022, Chen *et al*. described construction of a recombinant SARS-CoV-2 in which the gene encoding the spike protein of the Omicron virus variant was inserted into the genome of the original SARS-CoV-2 virus. The new virus, in an experiment, caused severe disease in mice with a mortality rate of up to 80%.[7]

Thus, since the very beginning of the emergence of technologies that allowed constructing reassortant (recombinant, hybrid, and chimeric) RNA and DNA molecules, study on creating new viruses which were not in nature have never stopped even during COVID-19 pandemic.

Restrictions on research leading to increased pathogenicity or transmissibility of the potential pandemic viruses

A number of the reports presented at the conference held in Malta in September 2011 caused a heated discussion among both scientists and journalists. On December 20, 2011, a spokesman for the National Science Advisory Board for Biosecurity stated that henceforth it is recommended that only the final results of experiments and conclusions be published, without a detailed description of the process used to create new dangerous viruses.[43]

On October 17, 2014, due to the growing threat of the emergence of new dangerous viruses in the environment, gain-of-function researches with the viruses in the United States were temporarily suspended.[14] However, on January 9, 2017, the moratorium was lifted. The commentary to the decree stated: "Adoption of these recommendations will satisfy the requirements for lifting the current moratorium on certain life sciences research that could enhance a pathogen's virulence and/or transmissibility to produce a potential pandemic pathogen."[45]

Cases of threats of leakage of dangerous pathogens from biological laboratories

Despite numerous statements that research on virus modification were carried out in laboratories with a high degree of safety, nevertheless, cases of violations of the rules for storing and transporting dangerous viruses outside the laboratories are known. Here are just a few examples.

On August 5, 2019, the *New York Times* published an article titled: "Deadly germ research is shut down at army lab over safety concerns." The laboratory, based in Fort Detrick, Maryland, contained about 70 highly dangerous pathogens and toxins, including those that cause Ebola, smallpox, anthrax and plague, and the poison ricin. The reason for the closure of the laboratory was a problem with disposal of dangerous materials.[12] Research at the Fort Detrick laboratory was already suspended in 2009 due to the discovery of 9220 vials of pathogens which were not listed in the database.[23]

Another dangerous case occurred in January-February 2009, when the Austrian pharmaceutical company Baxter sent vials of "vaccine" against influenza (H3N2) to laboratories in Germany, Slovenia and the Czech Republic. After the introduction of the "vaccine" to ferrets, some animals died. When checking, it turned out that the "vaccine" contained a live bird flu virus (H5N1). In the first explanation regarding the incident, Baxter representatives stated that the vaccines were contaminated with a dangerous virus by accident, probably during packaging. Later, a spokesman for Baxter admitted that instead of vaccines, they sent "experimental virus material," but it was not noted in the accompanying documents.[31]

In 2004–2005, the College of American Pathologists sent test kits to more than 3700 laboratories in 18 countries, including Belgium, Brazil, Canada, France, Germany, Israel, Italy, Japan, Mexico, Singapore, and the USA. While testing some of the samples an influenza A/H2N2 virus was identified. This influenza virus circulated in humans at the beginning of the pandemic in 1957–58, but employees of the laboratories were not informed about the possibility of the presence of a dangerous virus in the kits sent to test their qualifications.[25]

DISCUSSION

This review suggests that the emergence of new genetically modified viruses became possible no later than the mid-1950s. In the ongoing studies, natural viruses were treated with various physical or chemical agents, and then they were selected depending on the weakening or strengthening of the pathogenic functions of the virus. As is known, the first pandemic caused by a reassortant virus, including the genes of the avian and human influenza viruses (H2N2), occurred in 1957–1958.[24]

Later it became possible to combine the genes of different viruses and insert the genes of some viruses into the genomes of other viruses. Since that time, the production of vector vaccines has begun, for which genetically modified reassortant viruses were used. The construction of viruses similar to SARS-CoV-2 became possible around the border of 1980s and 1990s. It is likely that the first reassortant virus, which included the genes of four different virus at the same time, was discovered in nature during the "swine flu" pandemic that began in the spring of 2009.[50]

At present, there are all the necessary technologies for assembling any full-sized virus based on the nucleotide sequence available in the virus database, or for creating a new artificial virus based on a virtual model offered by a computer.

CONCLUSION

The given above has confirmed that before the emergence of COVID-19 pandemic the ability of genetic engineering of the viruses was more advanced than needed to construct the virus which is similar to SARS-CoV-2. Thus, scientists around the world should support Neil Harrison and Jeffrey Sachs of Columbia University (USA) in calling for a thorough and independent investigation into the origin of SARS-CoV-2.[20] Only a full understanding of the origin of the new virus can minimize the likelihood of a similar pandemic in the future.[46]

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

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Conflicts of interest

There are no conflicts of interest.

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COVID-19

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Teppone M.

THE PHASE DYNAMICS OF THE COVID-19 PANDEMIC: A SYSTEMATIC ANALYSIS OF 213 COUNTRIES AND TERRITORIES

The Nano City Holdings Berhad, No. 1, Jalan Sungai Jeluh 32/192, Shah Alam, 40460, Selangor, Malaysia

The study was carried out to evaluate the dynamics of monthly numbers of cases, deaths, tests and case fatality ratio worldwide during three phases of the COVID-19 pandemic.

Material and methods: Twenty-three sets of databases, dated the 22nd of each month from January 2020 to November 2021, for 213 countries were collected from the Worldometer website. The number of cases, deaths, tests, case fatality ratio, infection fatality ratio, etc. were counted for various periods of time for each of the 213 countries, then the results related to different periods of time were compared.

The analysis of main epidemiological parameters resulted in division of three phases of the global pandemic evolution. The first phase (23.01.20–22.07.20), the second phase (23.07.20–22.01.21) and the third phase (23.01.21–22.07.21) were different in terms of the number of tests performed, new cases and mortality due to COVID-19. By the end of second phase, the worldwide statistics indicated imminent end of the pandemic, but the third phase was characterized by sudden rise in the number of new cases and deaths that could not be explained rationally. The most dramatic evolution of epidemic curve occurred in the countries where physicians had successfully confronted COVID-19 during the first two phases of the pandemic.

Despite the decrease in the overall numbers deaths during the latest months analyzed, additional study is necessary to identify the cause of increasing in the number of new cases and deaths during the third phase of the pandemic.

Presumably, there are several causes of negative evolution of the current pandemic, including over-reliance on polymerase chain reaction tests, application of non-specialized premises for quarantine and treatment, non-professional management, following therapeutic protocols applied in countries with high number of deaths, ignoring preventive treatment, and decreasing in mass and individual immunity.

It can be suggested that the use of drugs modulating T-cell immunity is necessary, and preventive and therapeutic protocols should be changed from the 'standard' to 'personalized' types.

Ключевые слова: COVID-19; phases of the pandemic; mortality rate; case fatality ratio; infection fatality ratio; polymerase chain reaction

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For correspondence: Teppone M., the Medical Director of the Nano City Holdings Berhad, No. 1. e-mail: mikhail.teppone@gmail.com

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1. Introduction

Since the previous study dealing with the case fatality ratio and infection fatality ratio caused by COVID-19 [1], the author has received many comments that prompted the question: «Why did an optimistic prognosis fail?» To answer this question, a more detailed and expanded analysis was carried out in a new study.

1.1. Initial and current state of the COVID-19 pandemic narrative

On December 31, 2019, the WHO's China Country Office was alerted to cases of pneumonia of unknown cause detected in Wuhan City, Hubei Province of China. On January 3, 2020, the first complete genome of the novel coronavirus (2019-nCoVs) was identified. On February 11, 2020, a new disease was named «the coronavirus disease 2019» or CoViD-19 [2]. Further studies revealed that SARS-CoV-2 was circulating in various countries, including Spain, Italy, France, Brazil, USA, etc. before the outbreak of the epidemic in China [3].

During the initial stage of the COVID-19 pandemic two well-known discoveries, namely: “Unique inserts in the 2019-nCoV spike protein” [4] and “Reduction and functional exhaustion of T-cells in patients with coronavirus disease 2019 (COVID-19)” [5], were published. These discoveries demonstrated structural and functional similarities between two viruses and prompted a common sense question about the origin of SARS-CoV-2. Questions about the origins of the virus resurfaced in December 2020 when production of an Australian vaccine was discontinued as healthy vaccinated people became tested positive for HIV [6].

Other curious issues of the pandemic related to the anomalous epidemic curve:

(1) *New patterns*: In April 2020, an expert in epidemiology, Prof. Vladimir Nikiforov mentioned: «if the virus followed the 'classical pattern', the epidemic would

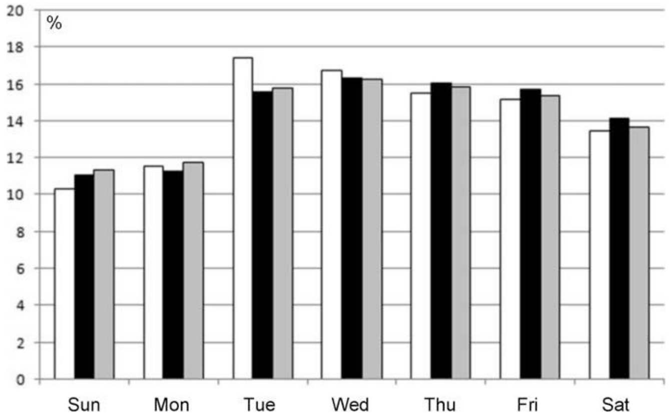

Fig. 1. Daily mortality due to COVID-19 on various days of the week.

have ended within three months, but now we are faced with something new» [7].

(2) *Data adjustments*: During the first year of the pandemic there were many cases of local number adjustments that affected the worldwide statistics related to COVID-19. For example, on May 25, 2020, a report of Spain was reduced by 1915 deaths; on June 3, 2020, a report of France was reduced by 37,895 cases; on August 13, 2020, a report of the United Kingdom was reduced by 29,726 cases and by 5,319 deaths; on August 14, 2020, a report of Peru increased by 3,935 new deaths, and so on [8].

(3) *A synchronization-like phenomena*: The first example of synchronization was a weekly mortality cycle which became noticeable in Brazil, Chili, in the United Kingdom, and the United States of America since April 2020. Later this anomalous cycle of daily death spread to many other countries. A comparison of the percentage of fatal cases on different days of the week for a period of 100 weeks (26.01.20–25.12.21) revealed almost identical distribution as described in a previous study [9] (Fig. 1).

There is another example of synchronization related to the daily new cases of COVID-19. During 1.5 years of the pandemic the highest number of daily new cases in the United States and the United Kingdom were recorded on the same day, on January 8, 2021; together they accounted for 44% of the total number of new cases worldwide [8].

White columns — period of 4 weeks (05.04.20–02.05.20) in the USA; black columns — period of 40 weeks (01.03.20-05.12.20) worldwide; grey columns — period of 100 weeks (26.01.20–25.12.21) worldwide. The vertical axis shows percentages; the horizontal axis shows days of the week.

(4) *A Strange evolution of the pandemic*: In mid-December 2021, a well-known expert in infectious diseases, Dr. Anthony Fauci, said: "it's 'unprecedented' how long the COVID-19 pandemic has lasted globally, with many countries enduring multiple major waves of infections since it was declared in March 2020" [10]. So, a pertinent question that pops up is: why, despite unprecedented control measures to prevent the spread of a new virus, including worldwide quarantines, isolation, movement control order, curfew, social distancing, wearing of masks and mass vaccinations, the epidemic curve still has a 'wave-like' or 'propagated' shape instead of going down? Were preventive measures effective, or simply useless or harmful?

1.2. Infectious disease — a battle between the human body's defense and viruses or bacteria

History of the battle against viruses and bacteria dates back at least several thousand years. Ancient physicians already knew about external pathogens which could cause acute febrile diseases. They also knew that an evolution of any clinical case depended on the health status of the patient before the onset of the disease, so they talked about «body defense». At the beginning of modern microbiology, the importance of body resistance was confirmed by a Prof. Max von Pettenkofer, who swallowed the entire contents of a tube filled with germs of cholera, but nothing happened to him. So, he claimed: «The important thing is the disposition of the individual!» [11].

Despite a variety of external pathogens, the human body has a limited number of defense mechanisms, which is accompanied by a few clinical syndromes, consisting of common symptoms, such as fatigue, chills or hot feeling, headache, cough, shortness of breath, nausea, vomiting, diarrhea, skin rashes or discoloration of the skin, etc.

In ancient times the mechanism of the onset of fever was differentiated into two main groups based on the presence of thirst, sweating, chills, or feelings of heat; and the choice of individual treatment was determined by the type of fever. According to the modern view on fever, which commonly accompanies infectious diseases, one can define only two mechanisms leading to an increase in temperature: one is an increase in heat production and the other, a decrease in heat transfer, or their combination [12]. Thus ancient and modern explanations of fever are quite similar, and two types of antipyretic medicines are necessary and sufficient to manage any case of excessive fever. Similarly, 2–3 mechanisms can be identified that underlie each of the remaining symptoms of any acute viral disease, so, a small group of commonly used drugs would be sufficient to manage any infectious diseases, including *old* and *new* ones.

After the discovery of bacteria and viruses as a cause of infectious diseases, the main emphasis was changed from supporting the body resistance to the fighting against pathogens. It was successful in the majority of bacterial infection cases, but it was almost useless when disease was caused by a virus.

Therefore, if there is no etiotropic treatment, then there is no need to identify a new viral disease. All pharmaceutical and non-pharmaceutical therapeutic modalities would be addressed to the well-known protective mechanisms of the human body, and treatment should be based on the leading syndromes and symptoms, using the principle called *off-label* therapy.

1.3. The classical foundation of medicine is wisdom, which is evergreen

Multiplication tables, the Pythogorean theorem, Archimedes' law, ideas of inertia and atomic structure of matter appeared several thousand years ago. In the course of history, ancient knowledge developed and improved until it turned into higher Mathematics and quantum Physics. However, the multiplication table, Archimedes' law and other basic knowledge have not lost their value in our time.

Similarly, ancient medicine also had its own canon, preserved within the framework of traditional Chinese medicine. The most important law of that canon was postulate: to strengthen or reinforce that which is deficient, and drain or sedate that which is excessive [13]. Over the centuries, it has taken on new forms, and was introduced in the theory of *Sthenic* and *Asthenic* diseases by Dr. John Brown [14]. At the beginning of the 20th century, two physiologists presented this postulate in the form of theories of *Dominant* and *Parabiosis* [15]. In the 1930s, Hans Selye discovered a dynamic interaction between excess and deficiency, and described General Adaptation Syndrome theory, which distinguished the *Alarm Phase* (= excess, sthenic disease, dominant) and *Exhaustion Phase* (= deficiency, asthenic disease, parabiosis) [16].

At the beginning of organotherapy doctors used extracts of animal organs to treat various age-related problems, also commonly known as frailty nowadays [17]. Later a modern branch of organotherapy, taking the form of hormonotherapy, became a powerful tool to treat various diseases caused by hormonal insufficiency. They followed the first part of the ancient postulate: *to strengthen or reinforce that which is deficient.* When antibiotics were discovered, physicians got a tool to inhibit bacterial growth. Application of antibiotics was an example of following the second ancient postulate: *drain or sedate that which is excessive.*

Further development of medicine did not follow the basic canon, and treatment was not addressed to a primary cause of disease. Nowadays despite the fact that deficiency patterns are the causes of the majority of chronic diseases, especially among elderly people, antagonists, blockers, or inhibitors, such as α-blockers, β-blockers, calcium channel blockers, ACE inhibitors, PDF-5 inhibitors, and H2 antagonists are used for therapy. Before prescribing sedative therapy, patients are not tested whether the corresponding target is in an excited state or not. So, a rational medical sense is ignored, and patients have to take medication for all their life.

The same problem has arisen with the treatment of COVID-19. The main pathologic target was T-cell immune-deficiency [5], nevertheless a lot of attention was paid to the cytokine storm, which was a consequence, but not a primary cause. According to basic medical law, treatment should be focused more at restoring T-cell immunity [18], and less against increased activity of certain components of the immune system.

1.4. Treatment of patients suffering from acute infectious diseases

About 1800 years ago, Dr. Zhang Zhongjing summarized the results of research from previous generations and developed a theory of acute infectious diseases, which explained therapy based on leading clinical symptoms and syndromes [19]. According to this theory, there could be only 6 phases, and certain phases could have 2–3 variants. Thus, the whole variety of clinical syndromes related to infectious diseases was limited to 10–12 variants, each having specific treatment and prevention.

There are some examples of treatment of the initial phases of infectious diseases: in the case of initial fever with general cold feelings without sweating — *Herba Ephedrae* was recommended; if there is initial fever with general hot feelings — *Folium Mori Albae* or *Herba Menthae Haplocalycis* should be used; if there is initial fever with intensive sweating or tension in the muscles — *Ramulus Cinnamomi Cassiae* was recommended; in the case of fever with alternating cold and hot feelings — *Radix Bupleuri*, was used, etc. A change in symptoms pointed to a change in the phase of the disease and required an adjustment of therapy. If a patient has a severe fever with hemorrhagic symptoms, skin rashes, kidney and liver impairment, delirium, etc. — *Radix of Isatis tinctoria* should be applied [20].

It would be useful for modern pathophysiology to distinguish between various types of fever and choose antipyretic medicines (*paracetamol*, *ibuprofen*, etc) based on the pharmacodynamic of these popular drugs, but not empirically, as they are usually used.

During later centuries, protocols of infectious disease treatment were updated according to the new scientific discoveries of that time. Excepting deadly epidemic diseases (plague, smallpox, or cholera), therapy of other infectious diseases was effective and successful. Theoretically, modern medicine having a long history in the past and advanced pharmaceutical science nowadays must be able to treat any problem more effectively than our predecessors, but the helplessness of the modern medical system during the current pandemic was beyond common sense [21], and raised questions about the quality of medical education of the distinguished leaders and their followers. Surprising but true, a great deal of medical recommendations were developed and introduced by people who had no medical education, or lacked adequate knowledge in epidemiology, and no experience in battling infectious diseases.

1.5. Treatment of COVID-19 at initial phase of pandemic

At the beginning of the pandemic, WHO encouraged doctors to use well-known medicines as *off-label* treatment of a new disease since there were no approved drugs yet for the treatment of COVID-19 [22]. The majority of knowledgeable and experienced doctors who received high quality medical education treated patients suffering from COVID-19 with great success. They recommended using antiviral and anti-inflammatory drugs, including *ivermectin*, *colchicine*, *methylene blue*, *chloroquine* and *hydroxychloroquine*; anticoagulants, such as *dipyridamole* or *heparine*; immune modulators, such as *thymic extracts*, *thymic peptides*, solution of *formaldehyde*, *melatonin* and common adjuvants. A group of physicians, who had identified the similarity between COVID-19 and toxic damage to red blood cells, recommended using therapeutic protocols which were effective in cases of acute intoxication. Other experts recommended an inhalation with ethanol vapor and helium-oxygen mixture since those methods had already been applied to similar cases before. Plant derived medicines, including extracts of *Artemisia*, *Isatis* or *Colchicum* as well as green and black tea, and various complex prescriptions were also used either for prophylaxis or for combined therapy.

During the early days of the COVID-19 epidemic, doctors in Russia used their own treatment protocols, that resulted in very low mortality, and even raised questions and skepticism from the international medical community [23]. For example, in April–June 2020, in a hospital attached to the Moscow State University, 420 out of 424 indoor patients suffering from COVID-19 were successfully treated with routine medication. Effectiveness of the therapy was around 100%.

As basic medicines these doctors used *Colchicine*, *Dipyridamole*, *Bromhexine*, and *Spironolactone*; additional application of certain anticoagulants and corticosteroids depended on a particular case [24]. Thus, common medical knowledge and experience were enough to treat the infectious disease caused by the *new virus*.

Every doctor knows that effective therapy of any patient requires individual approach due to the natural difference between even two similar cases, especially if a patient suffers from COVID-19. Following standard protocols without dose adjustment and individual correction of used medicines in certain clinical trials resulted in decreasing or even losing effectiveness of the drugs that had been used by other doctors earlier on [25]. Nevertheless, knowledgeable doctors continued their successful and effective treatments [26–28]. The therapeutic effects of the medicines mentioned above have been proven in further clinical trials and the results were published in various peer-reviewed journals.

After recent discussions on therapeutic protocols taking place between various experts, Dr. Peter A. McCullough recommended to his colleagues to treat COVID-19 patients according to their own knowledge and experience. One can only deduce there is no common sense for doctors to follow the protocol of an expert or a country where mortality was high, otherwise they would witness the same high mortality among their patients.

1.6. Clinical trials

Early in the 18th century, homeopathic doctors, who studied pathogenesis of new remedies, introduced extensive and multi-centered clinical trials to the medical public. They needed to differentiate the primary and secondary symptoms, and to separate important symptoms from non-important ones, and so on. According to the demand of homeopathic pharmacy, there was a rationale for using large groups of people. Nevertheless, extensive trials were criticized by Dr. Rudolf Virchow, the father of modern Pathology. He insisted that despite certain similarities in pathology discovered in different patients with a similar disease, each patient has his/her individual disease, so instead of using statistics collected from large groups of patients, doctors should pay more attention to detailed analysis of every case [29].

As far as acute infectious diseases are concerned, their pathological condition is not stable, but has several phases. Each of the phases requires the use of different medicines and patient care. It would be illogical to look for the treatment of COVID-19 in general, when each phase of the disease requires an appropriate group of medicines. Then a doctor should choose one or two medicines, taking into account the main symptoms of a certain patient. Multiple attempts to find a unique medicine against 'COVID-19' have failed. That suggests that treatment of COVID-19 or any further new acute viral infectious diseases should be managed by means of routine drugs applied as *off-label* therapy.

When COVID-19 was announced as a new disease, healthcare worldwide was challenged to conduct new clinical trials to find medicines that were safe and effective in treating COVID-19 and comorbidities. After Dr. T. A. Ghebreyesus expressed an opinion about the pandemic [21], all patients suspected of being infected with SARS-CoV-2 were automatically made participants of clinical trials which were the most extensive in the history of mankind.

Since all the pathogenic mechanisms encountered in COVID-19 were already well-known before May, 2020, the further treatment of COVID-19 should not have been difficult.

Moreover, since some routine medicines had already been used successfully, the main goal of further clinical trials should have been to design the most effective and adjustable protocols, but not to reject the effects of the used medicines. Unfortunately, many ongoing clinical trials have ended up demonstrating insufficient knowledge and experience of the physicians conducting the research.

For experienced physicians with a solid background, clinical trials were not necessary. Since they knew the pathogenesis of COVID-19 and pharmacodynamic of the medicines used, in their clinics efficacy, of therapy must be around 100% [26–28]. But results of clinical trials were very important and useful for beginners, since standard protocols help them to reduce the number of adverse reactions of their treatment.

1.7. Case fatality ratio and infection fatality ratio

There are two most important characteristics of infectious diseases: the first is a case fatality ratio (CFR) and the second, an infection fatality ratio (IFR). Case fatality ratio is the proportion between the number of patients who died from COVID-19 and the number of confirmed cases of COVID-19, while infection fatality ratio is the proportion between the number of patients who died from COVID-19 and the number of estimated cases infected with SARS-CoV-19.

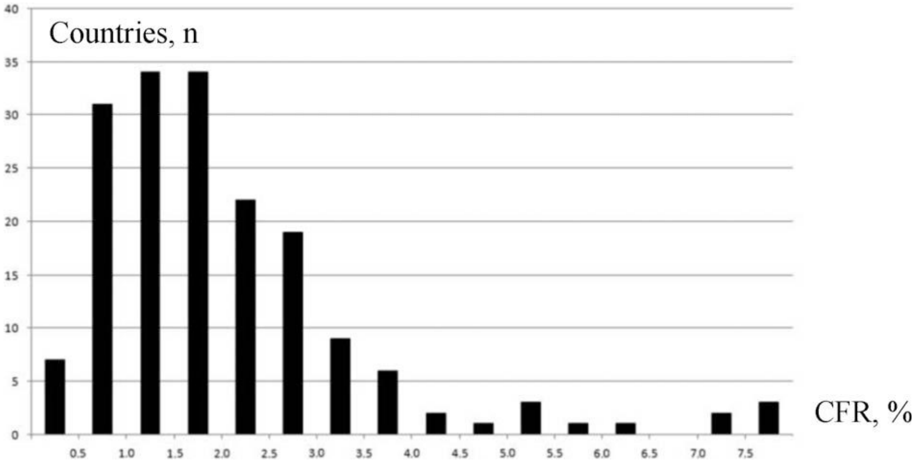

Fig. 2. Distribution of 175 countries into 16 groups according to a CFR value. 16 groups are: 1) CFR < 0.5%, n=7; 2) 0.5-1.0%, n=31; 3) 1.0-1.5%, n=34; 4) 1.5-2.0%, n=34; 5) 2.0-2.5%, n=22; 6) 2.5-3.0%, n=19; 7) 3.0-3.5%, n=9; 8) 3.5-4.0%, n=6; 9) 4.0-4.5%, n=2; 10) 4.5-5.0%, n=1; 11) 5.0-5.5%, n=3; 12) 5.5-6.0%, n=1; 13) 6.0-6.5%, n=1; 14) 6.5-7.0%, n=0; 15) 7.0-7.5%, n=2; 16) CFR>7.5%, n=3.

To identify the total number of infection prevalence, tests were carried out for the presence of the viral genome — Polymerase chain reaction (PCR), or for specific antibodies against SARS-CoV-2 virus (IgM and IgG). Since PCR provided positive results for a limited time after infection, and specific antibodies were produced and circulated in the blood of an infected person from several months up to a year, the percentage of seroprevalence would always be lower than the real one, and, therefore, IFR from COVID-19 would be always overestimated.

In a study published by J. Ioannidis (2020), at the end of October 2020, the number of infected people worldwide reached 10% [30]. Similar proportion of infected people in October 2020 was calculated for Belgium, Brazil, and the United States [31]. On January 29, 2021, the Mayor of Moscow, Sergei Sobyanin announced that «half of Moscow's 12 million residents have had Covid-19» and recovered. That estimation was based on a trial where antibodies to the SARS-CoV-2 virus were found in more than half of the blood samples taken randomly from a thousand healthy residents of Moscow [32]. One may suppose that since the beginning of the pandemic, major populations of large cities have already been infected with SARS-CoV-2 and have some circulated antibodies or have memory about this virus stored in the T-cells.

1.8. Databases were collected from Worldometer website

Information on cumulative numbers of the total cases and deaths due to COVID-19 is available at the Worldometer website from January 21, 2020 [8]. On January 23, 2020, a controversial article on RT-PCR tests was published [33], and a historical session of the World Economic Forum devoted to Wuhan Coronavirus took place in Davos [34]. Despite the fact that there was no cause for alarm yet, January 23, 2020 was chosen as the first day of the current study.

To provide an overall and detailed analysis of the COVID-19 pandemic, one year and a half was divided into three phases: (23.01.20–22.07.20), (23.07.20–22.01.21) and (23.01.21–22.07.21). Twenty-three sets of databases, dated the 22nd of each month from January 2020 to November 2021, were collected. Raw data included more than 20,000 figures in total. Only simple calculations using MS Excel easily understandable by any doctor have been used.

The databases related to each month for every country were calculated by subtracting the previous month's data from the analyzed month's data. For example, in China on 22.02.20 there were 76,923 cases, and 2,441 deaths, and on 22.01.20 there were 571 cases and 17 deaths. Subtracting the second from the first, one concludes that from 23.01.20 to 22.02.20 there were 76,352 cases and 2,424 deaths, and so on. The same method was used to count the database related to each phase for every country. Since only 213 countries[1] were affected by COVID-19 during the first phase, these 213 countries were analyzed during the current study.

2. One and a half years of the pandemic: Case fatality ratio and infection fatality ratio

Objective: To evaluate CFR and IFR in 213 countries during one and a half years of COVID-19 pandemic.

2.1. Calculation of CFR among COVID-19 patients in 213 countries

Material and Methods: To calculate the CFR and IFR worldwide, the databases of 213 countries dated July 22, 2021, 23:49 GMT, were collected at the Worldometer website. A case fatality ratio was calculated by dividing the number of deaths by the number of confirmed cases.

Results: The overall case fatality ratio for 213 countries, counted by dividing the number of deaths (n=4,150,526) by the number of confirmed cases (n=193,348,564), was 2.147 %.

2.2. Calculation of CFR among COVID-19 patients in 175 countries

Material and Methods. To increase the homogeneity of the main group of study, 38 countries with death numbers fewer than 50 were excluded from further analysis. Thus, the main group of study was reduced to 175 countries, with a total population of 7,734,426,580 people. These countries had 193,207,132 confirmed cases and 4,149,944 fatal cases. For each country, the CFR was calculated by dividing the number of deaths by the number of confirmed cases.

Results. The overall case fatality ratio for 175 countries was 2.148 %. In this group the CFR ranged from 0.267 % in Qatar to 19.597 % in Yemen, and the average value of CFR was 2.146±1.965%. Based on the calculated CFR values, all countries were divided into 16 groups as shown in Fig. 2.

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[1] Here and below "Countries" means "Countries and Territories".

The first group (n=7) where CFR was less than 0.500 %, included Qatar (0.267%), Maldives (0.285%), UAE (0.286%), Cyprus (0.418%), Seychelles (0.490%), Mongolia (0.495%), and Vietnam (0.498%).

The groups # 9–16, where CFR exceeded 4.00 %, included 13 countries: Bulgaria (4.296%), Afghanistan (4.432%), Bosnia and Herzegovina (4.710%), China (5.017%), Taiwan (5.042%), Somalia (5.151%), Egypt (5.801%), Ecuador (6.415%), Syria (7.370%), Sudan (7.475%), Mexico (8.807%), Peru (9.316%), and Yemen (19.597%)

Conclusion. The calculations done in this section showed that in 38 out of 175 countries, CFR was less than 1.00%, in 68 countries CFR varied between 1.00% and 2.00%, and in 69 countries CFR was more than 2.00%. In 7 out of 175 countries, CFR was less than 0.50%.

2.3. Calculation of CFR among patients in 38 countries excluded from the main study

Material and Methods. The group of countries excluded from the main study consisted of 8 countries without fatal cases related to COVID-19, and 30 countries where the number of fatal cases was from 1 to 49. In 30 countries with a total population of 102,945,260, there were 140,853 cases of COVID-19 and 582 deaths caused by COVID-19. For each country, a CFR was calculated.

Results. In 18 out of 30 countries CFR was less than 1.00% (including 10 with CFR < 0.50%), in 8 countries CFR was between 1.00% and 2.00%, and in the remaining 4 countries, CFR was more than 2.00%. Since there were no fatal cases due to COVID-19 in 8 countries, the CFR was «0».

Conclusion. If the previous calculations done in section 2.2. were to be considered, then in 64 out of 213 countries, CFR was less than 1.00%; in 76 countries CFR varied between 1.00 and 2.00%; and in 73 countries, CFR was more than 2.00%. In 25 out of 213 countries, CFR was less than 0.50%.

2.4. Calculation of IFR among COVID-19 patients of 136 countries

Background. Before estimation of an infection fatality ratio, it was assumed that each person was tested only once, and the distribution of infected people among the entire population was equal. Therefore, the number of infected people was expected to increase in direct proportion to the increase in the number of new tests performed. The total number of infected people (IP) was derived from the number of total confirmed cases (C) divided by the total number of tests performed (T) and multiplied by the total population (P). Then, IFR was calculated by dividing the number of deaths due to COVID-19 (D) by the estimated number of people infected with the SARS-CoV-2 virus.

In the previous study[1] to estimate the number of infected people, a formula $\{IP=C \cdot P/T\}$ was used, but it was assumed that results of IFR $\{IFR=D/IP\}$ would be overestimated. Further comparison of the results calculated using this formula, with the results estimated in other studies [30,31] revealed the consistency of the results with a difference of around 1.8 fold; so, a corrected formula was $\{IP = (C \cdot P/T) \cdot 1.8\}$. The final adjusted formula used in the current study was $IFR = [(D \cdot T)/(C \cdot P)]/1.8$.

Material and Methods. After collecting the databases, countries with fewer than 50 reported cases of deaths, countries without information on the number of tests on SARS-CoV-2, and countries where the number of tests performed exceeded the total population, were excluded from the IFR study group.

The main group consisted of 136 countries with a total population of 6,864,034,602 people, 121,373,035 confirmed COVID-19 cases, 2,768,774 fatal cases related to COVID-19 and 1,370,764,127 COVID-19 tests. To calculate the number of infected people, a formula $\{IP=(C \cdot P/T) \cdot 1.8\}$ was used. To calculate infectious fatality ratio for each country a formula $\{IFR = [(D \cdot T)/(C \cdot P)]/1.8\}$ was used.

Results. Since 121,373,035 COVID-19 cases were detected after 1,370,764,127 tests, it can be expected that if the number of tests would reach the total population (6,864,034,602), the number of infected people would increase up to 1,093,985,210. Thus, the overall IFR for 136 countries would be $[(2{,}768{,}774 \cdot 1{,}370{,}764{,}127)/(121{,}373{,}035 \cdot 6{,}864{,}034{,}602)]/1.8 = 0.253\%$.

Among 136 countries analyzed, the IFR ranged from 0.003% in the Democratic Republic of Congo (the minimal value) to 2.340% in Peru (the maximal value).

Based on the estimated IFR values, all the countries analyzed were divided into 16 groups, as illustrated in Fig. 3.

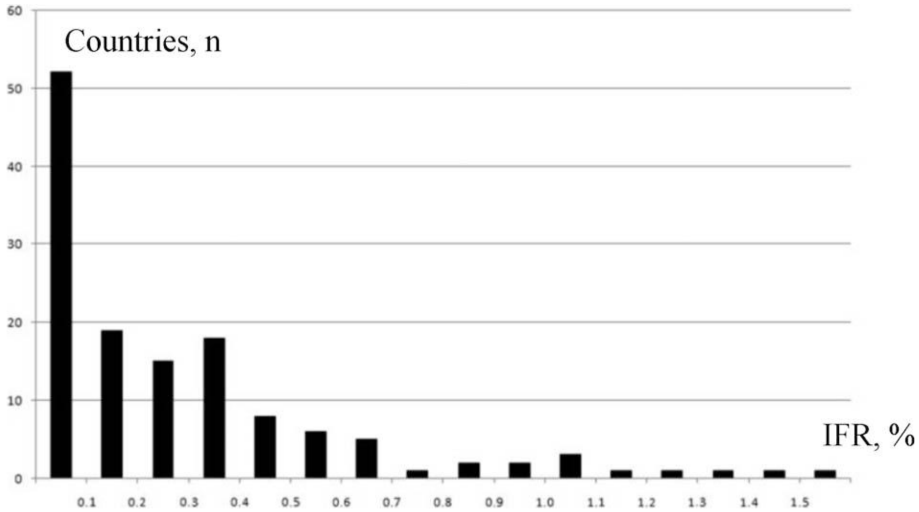
The first and largest group with the lowest value of IFR (< 0.10%) included 52 countries. Some of the countries had quite large populations, for example, Pakistan (P=225,392,516; IFR=0.088%), Nigeria (211,492,907; 0.008%), Bangladesh (166,414,749; 0.040%), Ethiopia (117,947,327; 0.022%), Egypt (104,359,775; 0.095%); Vietnam (98,259,748; 0.033%), etc. But other countries in this group had small populations, for example, Seychelles (P=98,988; IFR=0.059%), French Polynesia (282,617; 0.039%), Réunion (902,035; 0.049%), Equatorial Guinea (1,451,181; 0.090%), etc.

The groups # 11-16 with high values of IFR (>1.00%) included 8 countries: Slovakia (1.001%), Canada (1.030%), Germany (1.065%), Chile (1.134%), Bulgaria (1.207%), Hungary (1.343%), Australia (1.425%), and Peru (2.340%).

Conclusion. The calculations done in this section showed that in 128 out of 136 countries, the IFR was below 1.00 %, in 7 countries IFR was between 1.00 and 2.00 %, and only in 1 country IFR was above 2.00 %. In 112 out of 136 countries IFR was less than 0.50 %.

2.5. Estimation of IFR in the 77 countries excluded from the main study

Material and Methods. To estimate IFR for 52 countries, including 5 countries without information on the number of tests, and 47 countries where the number of



Fig, 3. Distribution of 136 countries into 16 groups according to a IFR value. 16 groups are: 1) IFR < 0.1%, n=52; 2) 0.1-0.2%, n=19; 3) 0.2-0.3%, n=15; 4) 0.3-0.4%, n=18; 5) 0.4-0.5%, n=8; 6) 0.5-0.6%, n=6; 7) 0.6-0.7%, n=5; 8) 0.7-0.8%, n=1; 9) 0.8-0.9%, n=2; 10) 0.9-1.0%, n=2; 11) 1.0-1.1%, n=3; 12) 1.1-1.2%, n=1; 13) 1.2-1.3%, n=1; 14) 1.3-1.4%, n=1; 15) 1.4-1.5%, n=1; 16) IFR > 1.5%, n=1.

tests performed exceeded the total population, a ratio between average CFR and average IFR in the main group of countries was calculated.

The main group (n=136) was divided into 4 subgroups: (1st) CFR was less than 1.00%, N=24; (2nd) CFR was between 1.00 and 2.00%, N=50; (3rd) CFR was between 2.00 and 3.00%, N=35; and (4th) CFR was higher than 3.00%, N=27. For each of these subgroups a ratio or a coefficient between average CFR and average IFR was counted: (1st) CFR/IFR=4.369; (2nd) CFR/IFR=5.991; (3rd) CFR/IFR=7.565; (4th) CFR/IFR=11.586. These four coefficients were used to calculate IFR in the group of 52 countries mentioned above.

In the group of countries (n=17) where the number of tests performed was higher than «0» but less than the population, and the number of deaths was less than 50, IFR was counted using the formula $IFR = [(D \cdot T)/(C \cdot P)]/1.8$, which was used in section 2.4.

Results. In 47 countries without information on the number of tests performed and 5 countries where the number of tests performed exceeded the total population (52 countries in total), the estimated IFR was less than 1.00%, including 51 countries, where IFR was less than 0.50%. In all countries where the number of deaths was less than 50 (n=17), IFR was less than 1.00 %; and in 14 out of 17 countries, IFR was less than 0.50%. In 8 countries without deaths, IFR was «0».

Conclusion. The calculations done in the section 2.4 and 2.5 revealed that in 205 out of 213 countries, IFR was less than 1.00 %; in 7 countries IFR was between 1.00% and 2.00 %; and only in 1 country IFR was more than 2.00 %. In 185 out of 213 countries IFR was less than 0.50 %. Taking into account the results of a study conducted in January 2021, when 50 % of Moscow's city population had already developed antibodies against SARS-CoV-2 [32], one may assume that in July, 2021, the percentage of seroprevalence could be even higher and IFR could be lower than estimated in the current study.

2.6. Dynamics of the main cumulative data during 22 months of the COVID-19 pandemic

Background. The current pandemic curve has a wave-like form with a gradual increase and decrease of

Table 1

Dynamics of the main cumulative data during 22 months of COVID-19 pandemic

#	Date	Cases	Deaths	Tests	Population	CFR	IFR	C/M	D/M
0	22.01.20	579	17	—	—	2.936	—	—	—
1	22.02.20	78,001	2,457	—	—	3.150	—	—	—
2	22.03.20	334,886	14,603	—	—	4.361	—	—	—
3	22.04.20	2,632,559	183,879	23,282,447	—	6.985	—	—	—
4	22.05.20	5,296,813	339,374	67,673,680	7,749,928,184	6.407	0.031	683	44
5	22.06.20	9,176,001	473,406	130,810,378	7,756,390,179	5.159	0.048	1,183	61
6	**22.07.20**	**15,362,745**	**625,395**	**302,374,544**	7,762,530,924	4.071	0.088	1,979	81
7	22.08.20	23,358,160	807,665	409,774,283	7,768,876,378	3.458	0.101	3,007	104
8	22.09.20	31,750,352	974,050	609,767,516	7,775,221,824	3.068	0.134	4,084	125
9	22.10.20	41,959,098	1,142,057	759,449,532	7,781,362,578	2.722	0.148	5,392	147
10	22.11.20	58,947,048	1,392,963	955,296,514	7,787,708,023	2.363	0.161	7,569	179
11	22.12.20	78,280,842	1,721,802	1,164,332,290	7,793,848,775	2.200	0.183	10,044	221
12	**22.01.21**	**98,669,593**	**2,113,750**	**1,375,887,509**	7,800,194,225	2.142	0.210	12,650	271
13	22.02.21	112,239,378	2,484,426	1,589,416,906	7,806,539,667	2.214	0.250	14,378	318
14	22.03.21	124,265,956	2,734,688	1,805,314,644	7,812,271,038	2.201	0.283	15,907	350
15	22.04.21	145,297,992	3,083,902	2,087,974,472	7,818,616,492	2.122	0.315	18,584	394
16	22.05.21	167,027,095	3,467,994	2,378,274,484	7,825,090,334	2.076	0.350	21,345	443
17	22.06.21	179,871,406	3,896,149	2,660,800,034	7,831,231,088	2.166	0.409	22,968	498
18	**22.07.21**	**193,348,564**	**4,150,533**	**2,926,443,254**	7,837,371,840	2.147	0.445	24,670	530
19	22.08.21	212,552,947	4,443,846	3,218,070,808	7,843,921,989	2.010	0.477	27,098	567
20	22.09.21	230,824,305	4,731,461	3,598,394,533	7,850,062,735	2.050	0.522	29,404	603
21	22.10.21	243,676,239	4,952,263	3,889,118,661	7,856,203,486	2.032	0.559	31,017	630
22	22.11.21	258,262,254	5,172,861	4,212,580,383	7,862,548,934	2.003	0.596	32,847	658

daily, weekly, and monthly numbers related to cases and deaths.

Material and Methods. Twenty-three sets of databases, which were dated the 22nd of each month from January 2020 to November 2021, were collected. The number of total COVID-19 cases, deaths due to COVID-19, tests performed, and population were presented in Table 1. CFR, IFR as well as number of cases per 1 million (C/M) and death per 1 million (D/M) were counted for each date (Table 1).

Results. During 22 months of the pandemic there was an increase in the total number of cases, deaths, and tests on COVID-19 as well as population worldwide. Comparisons between numbers related to the pandemic collected on January 22, 2021 (12 months, or 1 year) and July 22, 2021 (18 months, or 1.5 years), revealed that during the six months, parameters of the pandemic were almost doubled compared to the similar cumulative parameters during the previous one year. The number of COVID-19 cases and deaths increased by 1.96 fold, and the number of tests increased by 2.13 fold. The cumulative CFR was highest in April and May 2020, followed by a decreasing trend, but the estimated cumulative IFR increased gradually.

Conclusion. During the last 6 months of the analyzed 1.5 years of the pandemic, the number of COVID-19 cases, deaths and tests was dramatically increasing. To provide a more detailed analysis of this negative trend, 1.5 years was divided into 3 phases: the 1st phase (23.01.20–22.07.20), the 2nd phase (23.07.20–22.01.21), and the 3rd phase (23.01.21–22.07.21), which are analyzed in the next section.

Foot Note: An expanded version of this study with 10 tables, 96 illustrations, and 349 references has been published as a preprint: Teppone, M. COVID-19: Three Phases of the Pandemic. *Preprints* 2021, 2021070185 (doi: 10.20944/preprints202107.0185.v4).

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COVID-19

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Teppone M.

PHASE DYNAMICS OF THE COVID-19 PANDEMIC. A SYSTEMATIC ANALYSIS OF 213 COUNTRIES AND TERRITORIES. REPORT 2

The Nano City Holdings Berhad, No. 1, Jalan Sungai Jeluh 32/192, Shah Alam, 40460, Selangor, Malaysia

The study was carried out to evaluate the dynamics of monthly numbers of cases, deaths, tests and case fatality ratio worldwide during three phases of the COVID-19 pandemic.
Material and methods: Twenty-three sets of databases, dated the 22nd of each month from January 2020 to November 2021, for 213 countries were collected from the Worldometer website. The number of cases, deaths, tests, case fatality ratio, infection fatality ratio, etc. were counted for various periods of time for each of the 213 countries, then the results related to different periods of time were compared.
The analysis of main epidemiological parameters resulted in division of three phases of the global pandemic evolution. The first phase (23.01.20–22.07.20), the second phase (23.07.20–22.01.21) and the third phase (23.01.21–22.07.21) were different in terms of the number of tests performed, new cases and mortality due to COVID-19. By the end of second phase, the worldwide statistics indicated end of the pandemic, but the third phase was characterized by sudden rise in number of new cases and deaths. The most dramatic evolution of epidemic curve occurred in the countries where physicians had successfully confronted COVID-19 during the first two phases of the pandemic. Despite the decrease in the overall numbers deaths during the latest months analyzed, additional study is necessary to identify causes of new cases and deaths during the third phase of the pandemic. It can be suggested that preventive and therapeutic protocols should be changed from the 'standard' to 'personalized' types.

Keywords: *COVID-19; phases of the pandemic; mortality rate; case fatality ratio; infection fatality ratio; polymerase chain reaction.*

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For correspondence: Teppone M., the Medical Director, Nano City Holdings Berhad, No. 1, Jalan Sungai Jeluh 32/192, Shah Alam, Selangor, Malaysia. e-mail: mikhail.teppone@gmail.com

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3.1. Overall analysis of the three phases of the COVID-19 pandemic in 213 countries

Material and Methods. Four databases, dated 22.01.20, 22.07.20, 22.01.21 and 22.07.21 were collected from the Worldometer website. The number of cases, deaths, and tests related to each phase for each of the 213 countries was calculated by subtracting the previous phase's data from the analyzed phase's data. For example, on 22.01.21 there were 98,669,593 cases, 2,113,750 deaths, and 1,375,887,509 tests worldwide; and on 22.07.21 there were 193,348,564 cases, 4,150,533 deaths, and 2,926,443,254 tests. Subtracting the first numbers (dated 22.01.21) from the second (dated 22.07.21), one concludes that during the 6 months from 23.01.21 to 22.07.21 there were 94,678,971 new cases, 2,036,783 new deaths, and 1,550,555,745 new tests, etc. CFR for each phase was calculated.

Ratios between cases, deaths, and tests recorded during the 1st, 2nd and 3rd phases in relation to similar parameters recorded during the whole 1.5 years were also counted. Additionally, a calculation of ratios between cases, deaths, and tests recorded during 12 months of the first year of the pandemic in relation to similar parameters recorded during the whole 1.5 years was also carried out (Table 2).

Table 2

Numbers of cases, deaths and tests related to six months of each phase of the pandemic; numbers of cases, deaths and tests related to the first 12 months (phases I+II) and to the 18 months (phases I+II+III)

Phase, #	Date	Cases	%	Deaths	%	Tests	%	CFR, %
I	23.01.20–22.07.20	15,362,166	7.94	625,378	15.07	302,374,544	10.33	4.071
II	23.07.20–22.01.21	83,306,848	43.09	1,488,355	35.86	1,073,512,965	36.68	1.787
III	23.01.21–22.07.21	94,678,971	48.97	2,036,783	49.07	1,550,555,745	52.99	2.151
I+II+III	**23.01.20–22.07.21**	**193,348,564**	**100.0**	**4,150,533**	**100.0**	**2,926,443,254**	**100.0**	**2.147**
I+II	23.01.20–22.01.21	98,669,014	51.03	2,113,733	50.93	1,375,887,509	47.01	2.142
III	23.01.21–22.07.21	94,678,971	48.97	2,036,783	49.07	1,550,555,745	52.99	2.151
I+II+III	**23.01.20–22.07.21**	**193,348,564**	**100.0**	**4,150,533**	**100.0**	**2,926,443,254**	**100.0**	**2.147**

Results. According to the calculations done, the 3rd phase was characterized by a dramatic increase for all parameters of the pandemic, including cases, deaths, and tests. The most intensive growing parameter was tests conducted to reveal new suspicious cases of COVID-19. The case fatality ratio was highest in the 1st phase, then decreased in the 2nd phase and again increased in the 3rd phase.

3.2. Analysis of the three phases of the COVID-19 pandemic for each of the 213 countries

Material and Methods. Four databases for each country, dated 22.01.20, 22.07.20, 22.01.21 and 22.07.21 were collected from the Worldometer website.

The number of cases, deaths, and tests related to each phase for every country was calculated by subtracting the previous phase's data from the analyzed phase's data. For example, in Malaysia, on 22.01.20, there were no deaths; on 22.07.20, there were 123 deaths; on 22.01.21, there were 660 deaths, and on 22.07.21, there were 7,574 deaths in total. Subtracting '0' from 123, 123 from 660, and 660 from 7,574, one concludes that during the 6 months, from 23.01.20 to 22.07.20 there were 123 deaths; from 23.07.20 to 22.01.21 there were 537 deaths; and from 23.01.21 to 22.07.21 there were 6,914 new deaths. A CFR was calculated for each country for every phase.

Then a comparison between the number of cases, deaths, and tests recorded during the 3rd phase of the pandemic (23.01.21—22.07.21) and the number of similar parameters recorded during the 1.5 years (23.01.20—22.07.21) was carried out for each country.

For example, in Mongolia, at the end of the 2nd phase (22.01.21), there were 2 deaths only; but at the end of the 3rd phase or 1.5 years of the pandemic (22.07.21), there were 755 deaths in total. After simple calculations one can conclude that during 6 months of the 3rd phase of the pandemic there were 753 new deaths in Mongolia. If the number of deaths for the 3rd phase (n=753) is divided by the number of deaths for 1.5 years of the pandemic (n=755), it can be concluded that during the 1.5 years of the pandemic, 99.74% of deaths due to COVID-19 in Mongolia took place during the 3rd phase of the COVID-19 pandemic.

If the ratio between numbers recorded during the 3rd phase and the numbers recorded during the whole 1.5 years of the pandemic is higher than 33.33 %, it means the number of cases, or deaths or tests recorded during the 3rd phase was higher than the average number for each of the three phases. If this ratio is higher than 50.00 %, it means that the vast majority of cases, or deaths or tests took place during the 3rd phase of the pandemic. The higher the percentage, the more cases, deaths, or tests took place during the 3rd phase.

Results. There are 109 out of 213 countries, where more than 50.0 % of new cases were diagnosed during the 3rd phase of the pandemic; there are 107 countries where more than 50.0 % of new deaths were recorded during the 3rd phase of the pandemic; and there are 141 out of 213 countries where more than 50 % of tests on SARS-CoV-2 were performed during the 3rd phase of the pandemic.

Number of countries with a CFR less than 1.00 % was 64 (30.05%) during the 1st phase, 91 (42.72 %) during the 2nd phase, and 73 (34.27 %) during the 3rd phase. The average CFR among the countries (N) with fatal cases was 3.60±3.73 % (N=185) during the 1st phase, 1.86±2.62 % (N=194) during the 2nd phase, and 2.03±2.10 % (N=197) during the 3rd phase.

A list of countries where more than 80 % of deaths due to COVID-19 took place during the 3rd phase of the pandemic includes Antigua and Barbuda, Barbados, Botswana, British Virgin Islands, Cambodia, Caribbean Netherlands, Cuba, Curaçao, Eritrea, Fiji, Laos, Malaysia, Mongolia, Namibia, Papua New Guinea, Paraguay, Réunion, Saint Lucia, Saint Kitts and Nevis; Seychelles, Somalia, Sri Lanka, St. Vincent and the Grenadines, Taiwan, Thailand, Timor-Leste, Trinidad and Tobago, Uganda, Uruguay, Vietnam, and Zambia.

Conclusion. Calculations done in this section have revealed that in most countries, the main number of cases, deaths and tests were recorded during the 3rd phase of the pandemic. The average CFR was the highest during the 1st phase, and the lowest — during the 2nd phase of the pandemic.

4. Twenty-Two Months of the COVID-19 pandemic

4.1. Twenty-two months of the COVID-19 pandemic: Overall cases, deaths, tests and CFR worldwide

Objective. To evaluate dynamics of monthly numbers of cases, deaths, tests, and CFR worldwide during 22 months of the COVID-19 pandemic.

Material and Methods. Twenty-three sets of databases dated the 22nd of each month from January 2020 to November 2021, for 213 countries were collected. The databases related to each month for every country were calculated by subtracting the previous month's data from the analyzed month's data. The number of cases, deaths, tests as well as monthly ratios between cases and tests (C/T), deaths and tests (D/T), CFR, cases per 1 million (C/M) and deaths per 1 million (D/M) for all 213 countries together were counted and presented in Table 3. Monthly number of deaths was illustrated in Fig. 4.

Results. During 22 months of the pandemic, the monthly number of cases varied from 77,422 in the first month up to 21,729,103 in the 16th month; there are three peaks, in the 11—12th, 15—16th and 19—20th months. The monthly number of deaths varied from 2,440 in the first month up to 428,155 in the 17th month; there are two peaks, in the 12th month and in the 17th month (Fig. 4). The monthly number of tests increased almost gradually from 23,282,447 in the 3rd month, up to 380,323,725 in the 20th month.

The highest monthly CFR (7.367) and the highest monthly ratio between cases and tests (9.869), as well as deaths and tests (0.727) were in the 3rd month (23.03.20—22.04.20) of the pandemic. Since March 11, 2020, the highest weekly CFR (8.507%) was estimated

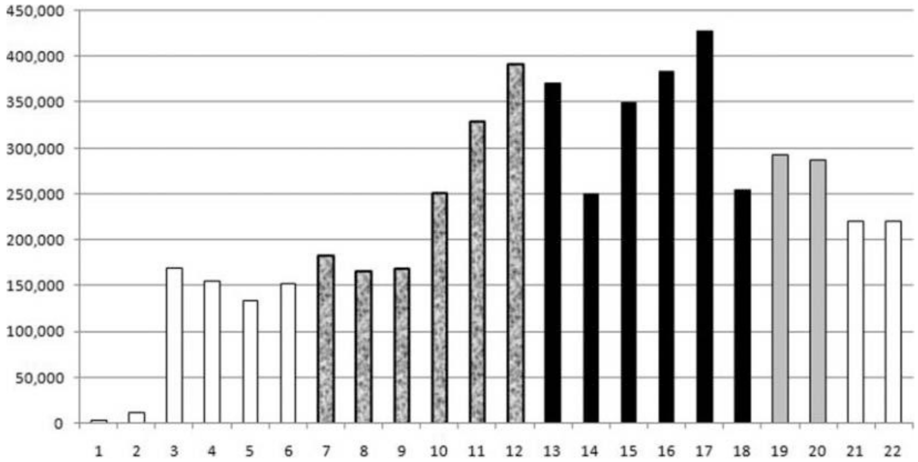

Fig. 4. Monthly number of deaths. The vertical axis shows number of deaths; the horizontal axis shows number of a month. The 1st phase includes months # 1—6 (white columns); the 2nd phase includes months # 7—12 (grey-white columns); the 3rd phase includes months # 13—18 (black columns); months # 19—20 (grey columns); months # 21—22 (white columns).

for the week April 12—18, 2020, and the highest daily CFR (9.514%) was estimated for April 17, 2020 [1].

4.2. Evolution of the COVID-19 pandemic before and after the end of the 3rd Phase

Background. During 1.5 years of the pandemic, in most of the countries analyzed, number of COVID-19 cases, deaths and tests were highest during the 3rd phase.

Objective. To analyze the evolution of COVID-19 pandemic before and after the end of the 3rd phase.

Material and Methods. Three databases for each country, dated 22.05.21, 22.07.21, and 22.09.21 were collected from the Worldometer website. Then, for each country, the cases, deaths, and tests were calculated for 2 periods of time: (1st) 23.05.21 — 22.07.21 and (2nd) 23.07.21 — 22.09.21.

The trend of the pandemic was analyzed by dividing the numbers recorded during the 2nd period by the numbers recorded during the 1st period, accordingly. If the ratio is more than 1, i.e., more than 100 %, it means that after the end of the 3rd phase, there is still an upward trend in the number of COVID-19 cases, deaths, or tests in a certain country.

For example, in the United Kingdom, there were 127,716 total deaths on 22.05.21, 128,980 on 22.07.21, and 135,621 on 22.09.21. Hence, there were 6,641 new deaths recorded during the 2nd period (23.07.21 — 22.09.21) and 1,264 new deaths recorded during the 1st period (23.05.21 — 22.07.21). Dividing 6,641 by 1,264 resulted in 5.225. That means, the number of deaths during the second period was more than five times higher than the number of deaths during the 1st period. Thus, in the United Kingdom there was a trend pointing to a dramatic increase in the number of deaths, etc.

Results. A comparison of the main parameters of the pandemic between the 2nd and 1st period for each country revealed that in most of them, there was an upward trend pointing to an increase in cases (n=158; 74.18 %), deaths (n=133; 62.44 %) and tests (n=125; 58.69 %) (Table 4).

Conclusion. Groups of countries with a dramatic increase in COVID-19 cases, deaths, and tests during the 2nd period (23.07.21 — 22.09.21), in comparison with the 1st period 23.05.21 — 22.07.21), were unveiled. In some of these countries the difference between analyzed parameters exceeded 10—20 times.

Table 3

Monthly parameters of COVID-19 pandemic during 22 months worldwide

M,#	Date	Cases	Deaths	Tests	CFR	C/T	D/T	C/M	D/M
0	before 22.01.20	579	17	—	2.936	—	—	—	—
1	23.01.20–22.02.20	77,422	2,440	—	3.152	—	—	—	—
2	23.02.20–22.03.20	256,885	12,146	—	4.728	—	—	—	—
3	23.03.20–22.04.20	2,297,673	169,276	23,282,447	7.367	9.869	0.727	—	—
4	23.04.20–22.05.20	2,664,254	155,495	44,391,233	5.836	6.002	0.350	344	20
5	23.05.20–22.06.20	3,879,188	134,032	63,136,698	3.455	6.144	0.212	500	17
6	23.06.20–22.07.20	6,186,744	151,989	171,564,166	2.457	3.606	0.089	797	20
7	23.07.20–22.08.20	7,995,415	182,270	107,399,739	2.280	7.445	0.170	1,029	23
8	23.08.20–22.09.20	8,392,192	166,385	199,993,233	1.983	4.196	0.083	1,079	21
9	23.09.20–22.10.20	10,208,746	168,007	149,682,016	1.646	6.820	0.112	1,312	22
10	23.10.20–22.11.20	16,987,950	250,906	195,846,982	1.477	8.674	0.128	2,181	32
11	23.11.20–22.12.20	19,333,794	328,839	209,035,776	1.701	9.249	0.157	2,481	42
12	23.12.20–22.01.21	20,388,751	391,948	211,555,219	1.922	9.638	0.185	2,614	50
13	23.01.21–22.02.21	13,569,785	370,676	213,529,397	2.732	6.355	0.174	1,738	47
14	23.02.21–22.03.21	12,026,578	250,262	215,897,738	2.081	5.571	0.116	1,539	32
15	23.03.21–22.04.21	21,032,036	349,214	282,659,828	1.660	7.441	0.124	2,690	45
16	23.04.21–22.05.21	21,729,103	384,092	290,300,012	1.768	7.485	0.132	2,777	49
17	23.05.21–22.06.21	12,844,311	428,155	282,525,550	3.333	4.546	0.152	1,640	55
18	23.06.21–22.07.21	13,477,158	254,384	265,643,220	1.888	5.073	0.096	1,720	32
19	23.07.21–22.08.21	19,204,383	293,313	291,627,554	1.527	6.585	0.101	2,448	37
20	23.08.21–22.09.21	18,271,358	287,615	380,323,725	1.574	4.804	0.076	2,328	37
21	23.09.21–22.10.21	12,851,934	220,802	290,724,128	1.718	4.421	0.076	1,636	28
22	23.10.21–22.11.21	14,586,015	220,598	323,461,722	1.512	4.509	0.068	1,855	28

Table 4

Results of comparison between the numbers of cases, deaths and testes recorded in the databases of 213 countries during the 2nd (23.07.21—22.09.21) and the 1st (23.05.21—22.07.21) periods of time

#	Decrease / Increase	Cases		Deaths		Tests	
		n	%	n	%	n	%
1	Decrease (<100%)	53	24.88	65	30.52	69	32.39
2	No change	2	0.94	15	7.04	19	8.92
3	Increase (>100%)	158	74.18	133	62.44	125	58.69
	including:						
	from 0 to 1+n	4	01.88	16	07.51	3	01.41
	+ 100 — 200%	46	21.60	38	17.84	91	42.72
	+ 200 — 500%	54	25.35	46	21.60	24	11.27
	+ >500%	54	25.35	33	15.49	7	03.29
	Total	213	100	213	100	213	100

A list of countries where there was a dramatic increase in deaths after the end of the 3rd phase of the pandemic, includes: Albania, Aruba, Australia, Azerbaijan, Barbados, Belize, Benin, Bermuda, Burundi, Curaçao, Eswatini, French Polynesia, Gambia, Ghana, Guadeloupe, Guinea-Bissau, Israel, Ivory Coast, Kazakhstan, Libya, Malta, Martinique, Mauritius, Morocco, Nigeria, North Macedonia, Saint Lucia, Singapore, Somalia, Timor-Leste, Togo, the United Kingdom, and Vietnam.

In three countries: Guadeloupe, Israel, Vietnam, there was a dramatic increase in all parameters including cases, deaths, and tests.

4.3. Comparison of the average monthly number of cases, deaths, and tests in each of the 213 countries related to the latest month analyzed # 22 (23.10.21 — 22.11.21) and the previous month # 21 (23.09.21 — 22.10.21)

Objective. To evaluate the dynamics of the monthly number of cases, deaths, and tests in each of the 213 countries during the months # 21—22, and to identify countries with a negative tendency.

Material and Methods. The number of monthly cases, deaths, and tests for the months # 22 (23.10.21 — 22.11.21) and # 21 (23.09.21 — 22.10.21) was counted in the same manner as in the previous sections. A comparison between two months was done by dividing the numbers related to month # 22 by the numbers related to the month # 21. If the ratio is more than 1, i.e., more than 100 %, it indicates a continuous upward trend in the number of COVID-19 cases, deaths, or tests in a certain country. If the ratio is less than one (<100%), it means parameters of the pandemic tended to decrease.

Results. A comparison of the data related to the month # 22 with the data related to the previous month (# 21) revealed a trend showing a decrease in number of cases, deaths, and tests.

Nevertheless, there are a few countries where the monthly number of cases and deaths during the month # 22 was at least 5 times higher than during the previous month # 21. For example, a dramatic increase in both cases and deaths took place in Poland (638%; 535%), Czechia (803%; 1075 %), and Hungary (733%; 768%).

Conclusion. The study done in this section has revealed that during the months # 21—22 in most of countries analyzed, the number of new COVID-19 cases, deaths and tests had shown a tendency to decrease. This is an objective basis for optimism and inspires hope for an end to the pandemic.

5. Discussion

An analysis of the main epidemiological parameters worldwide has resulted in distinguishing three phases of the pandemic worldwide: these phases are different in terms of the number of new tests, cases, and deaths, and they have their own features in each country.

The first phase (23.01.20 — 22.07.20) began with new cases and first victims of COVID-19 identified outside China. During the first phase, diagnostic tests to detect SARS-CoV-2 were used mainly on people with symptoms and their immediate contacts. Clinical trials of potentially effective drugs were in the initial phase, and invasive mechanical ventilation, which had no therapeutic effect on patients with COVID-19, was used very actively. Since protocols of treatment were not developed yet, and the number of confirmed cases was small, the CFR value was the highest in the first phase of the pandemic.

During the second phase (23.07.20 — 22.01.21) clinical trials were completed and doctors received effective protocols of treatment. Despite the emergence of new variants of the virus, mechanisms of the disease development remained unchanged and were not associated with a more severe course of the disease. In most countries the mortality rate was very low. By the end of the second phase, worldwide statistics indicated the imminent end of the pandemic [1].

During the third phase (23.01.21 — 22.07.21) of the pandemic, in various countries, mass vaccination was introduced to protect people against SARS-CoV-2. Coincidentally, a sudden rise in the number of new cases and deaths happened, and it could not be explained rationally. The highest number of monthly deaths was recorded between May 23, and June 22, 2021. The most dramatic evolution of the epidemic curve occurred in the countries where doctors had successfully battled COVID-19 during the first year of the pandemic.

The further evolution of the pandemic was an undulating continuation of the third phase. In the following countries the number of deaths continued to increase even during the latest month analyzed (# 22): Burkina Faso, Cameroon, Congo, Djibouti, Gabon, Hungary, Laos, Latvia, Lesotho, Papua New Guinea, Poland, Romania, Singapore, Slovakia, South Sudan, Tanzania, Ukraine, etc.

6. Conclusions

Two years have passed since the Wuhan Municipal Health Commission announced a pneumonia epidemic. Despite the positive dynamics during October-November 2021, the current pandemic is not over yet, and additional research is necessary to identify the cause of the increase in the number of new cases and deaths observed during the third phase of the pandemic.

After simulating a forecast done by Neil M. Ferguson and his team (Imperial College London) in March 2020 [35], many countries introduced social distancing, quar-

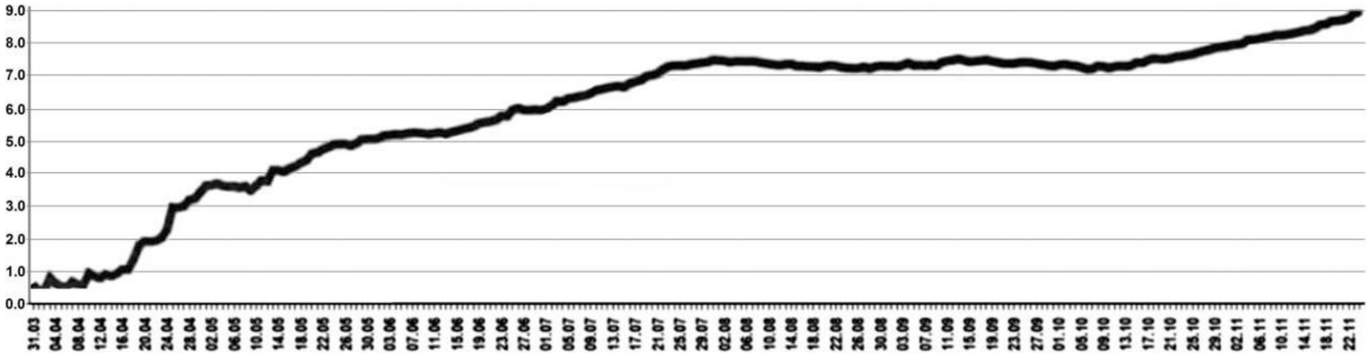

Fig. 5. A steady increase in mortality in the anti-COVID-19 hospital # 40 in Moscow City [50]. A modified screenshot of the panel lecture 'COVID-19 and Sepsis' at 1.55—2.35 min (24.11.20). The vertical axis shows mortality, the horizontal axis shows dates: from 31.03.20 to 22.11.20.

antines and lockdowns. Despite objections to Mr. Ferguson's calculations from his own colleagues [36], quarantine measures were continued. Medical prophylactic measure in the form of global vaccination program had already been proposed before introduction of quarantines and lockdowns, and even before the new disease got its own name [34].

There are plenty of studies which revealed that in certain cases, various prophylactic measures used to prevent the spread of SARS-CoV-2 and other viruses and bacteria, could have negative effects on the human body, could have low efficacy or may even be useless in terms of prevention of diseases [37—40].

Since the main target for SARS-CoV-2 are people with weak immunity [5], and prolonged mental stress affects both the entire body, and the immune system in particular [41], an additional study is needed to answer the question, if medical and non-medical measures used to prevent the spread of SARS-CoV-2 could affect natural immunity. This question is especially relevant for countries which had a dramatic increase in cases and deaths during the third phase of the pandemic. An affirmative answer to this question is highly probable since certain types of medical prophylactic products can reprogram immune system response [42], and without a new dose of a booster, immunity of the body of the vaccinated people declines after 3—6 months [43].

At the time when Dr. Tedros A. Ghebreyesus assumed the outbreak of the pandemic [21], objective data for such a decision was not available yet. Therefore, no official documents were issued and published. Five days later, Dr. Ghebreyesus explained that WHO did not know how many people were infected, and invited all countries to fill up this informative gap, by suggesting: “We have a simple message for all countries: test, test, test” [44]. Mass testing resulted in sudden outbreaks of COVID-19 in many countries and this fact could not be explained rationally based on the natural evolution of infectious diseases [45].

Previously, some experts had already rejected the reliability and validity of the RT-PCR test to be used for screening [46]. That rejection has been done to avoid negative epidemic consequences of false positive results which could be caused by the limitations of the diagnostic method itself, and errors of the software used, by contamination of the environment or test kits, as well as by application of a cycle threshold of 25—30 or higher [47]. A number of false positive results could be dramatically increased if the RT-PCR test is used to conduct large-volume screening at the area of low prevalence of SARS-CoV-2 [48]. Thus, mass-screening with RT-PCR test could create a false epidemic without a real basis.

Since the recent study by A. Stang et al. (2021) revealed that application of mass screening with RT-PCR test had no value to predict severe cases or deaths [49], an additional study is required to answer the question — if screening with RT-PCR test can increase the number of deaths, especially in countries where quarantine facilities do not provide isolated rooms for each person suspected to be infected.

One can assume that the application of non-specialized premises for quarantine and treatment of people suffering from infectious diseases can lead to unpredictable outcomes. For example, the conversion of a new general municipal hospital (#40) in Moscow City into a specialized hospital for COVID-19 patients without reconstructions according to the hygienic requirements for infectious hospitals resulted in the steady increase in hospital mortality from 0.5% on 31.03.20, up to 9.0% on 22.11.20 (Fig. 5). Three fourths of the patients died due to sepsis caused by *K. pneumoniae*, *A. baumannii*, *P. aeruginosa*, *E. coli*, *S. aureus*, fungus, etc. [50]. Since these data were presented by the head physician of the modern and well equipped hospital, one can assume that mass mortality from nosocomial infection was a common occurrence in COVID-19 hospitals worldwide.

A comparison of different therapeutic methods and protocols used during the current pandemic should be done to identify the most effective ones. An equally important task is to analyze information on the preventive effects of certain drugs, food supplements, vitamins, and microelements. This analysis should be carried out by experts in the appropriate field who have already demonstrated low mortality using their therapeutic protocols, but not by an outside reviewer who has no practical experience with analyzed remedies, and who selects and rejects publications using an unprofessional view of the reviewed remedy or method. Global negative consequences of unprofessional review of the topic can be demonstrated by the example of the use of hydroxychloroquine and chloroquine, where reviewers "were unable to confirm a benefit" of these effective drugs [25].

Thus, only complete information regarding the positive and negative impact of medical and non-medical methods of diagnostics and prophylaxis of COVID-19 can help to organize effective measures to end the current pandemic and prevent a similar one from occurring in the future.

Presumably, there are several causes of the negative evolution of the current pandemic, including (1) overreliance on PCR tests, (2) application of non-specialized premises for quarantine and treatment, (3) non-professional management, (4) following therapeutic protocols used in countries with high number of deaths, (5) ignoring prophylactic treatment, and (6) decreasing in herd and individual immunity.

It can be suggested that the use of drugs to modulate T-cell immunity (e.g., thymus extracts, or thymic peptides) is vital, and prophylactic and therapeutic protocols should be changed from the 'standard' types to 'personalized' ones

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Note: An expanded version of this study with 10 tables, 96 illustrations, and 349 references has been published as a preprint: Teppone, M. COVID-19: Three Phases of the Pandemic. Dynamics of Cases, Deaths and Tests related to SARS-CoV-2 A Systematic Analysis of 213 Countries and Territories. *Preprints* 2021, 2021070185 (doi: 10.20944/preprints202107.0185.v4).

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Три Фазы пандемии: Динамика случаев, смертей и тестов, связанных с SARS-CoV-2; Систематический анализ 213 стран и территорий.

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Три Фазы пандемии: Динамика случаев, смертей и тестов, связанных с SARS-CoV-2; Систематический анализ 213 стран и территорий.*

> Мэри Джо Таках (*M. Takach*), Неужели все еще нет лечения простуды? "Простуда похожа на погоду – все о ней говорят, но никто ничего не может с этим поделать … Недавно выделена новая группа вирусов, их называют "человеческий коронавирус," эти вирусы тоже могут вызывать обычные простудные заболевания …По оценкам доктора Джеймса Спрей, существует не менее 200 вирусов простуды … В прошлом году Национальный институт здоровья США, закрыл свой Совет по разработке вакцин от простуды, решив, что это пустая трата времени и денег".
> [*This World* (*San Francisco*), 1972, Oct 8, N 41: 28].

Тезисы

Предпосылки для проведения исследования:

Со времени предыдущего исследования, посвященного коэффициентам смертности, связанной с COVID-19, автор получил много комментариев, которые можно сформулировать в виде вопроса: "Почему не сработал оптимистичный прогноз?" Чтобы ответить на этот вопрос, было проведено новое расширенное исследование, с подробным анализом происходящей пандемии.

Цель исследования:

Оценить динамику ежемесячного количества случаев COVID-19, смертей, тестов и коэффициентов смертности во всем мире в течение трех фаз пандемии.

Материалы и методы:

С вебсайта Worldometer были собраны 23 комплекта баз данных, датированных 22-м числом каждого месяца с января 2020 г. по ноябрь 2021 г., для 213 стран. Количество случаев COVID-19, смертей из-за COVID-19, тестов на SARS-CoV-2, показателей смертности и т.д. было подсчитано за разные периоды времени для каждой из 213 стран; затем было проведено сравнение результатов, относящихся к разным периодам времени.

Результаты исследования:

Анализ основных эпидемиологических параметров привел к выделению трех фаз развития пандемии. Первая фаза (23.01.20-22.07.20), вторая фаза (23.07.20-22.01.21) и третья фаза (23.01.21-22.07.21) отличались по количеству выполненных тестов, а также по числу новых случаев и смертей, обусловленных COVID-19.

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[*] Перевод препринта: Teppone, M. COVID-19: Three Phases of the Pandemic. Dynamics Of Cases, Deaths And Tests Related To SARS-CoV-2 A Systematic Analysis of 213 Countries and Territories. Preprints 2021, 2021070185 (doi: 10.20944/preprints202107.0185.v4).

К концу второй фазы мировая статистика указывала на скорое завершение пандемии. Однако, третья фаза характеризовалась внезапным ростом числа новых случаев и смертей, которые не нашли рационального объяснения. Наиболее драматичная эволюция эпидемической кривой произошла в странах, где врачи успешно боролись с COVID-19 на протяжении первых двух фаз пандемии.

Выводы

Несмотря на снижение общего числа смертей за последние анализируемые месяцы, необходимо дополнительное исследование, *для выявления причин*, приведших к увеличению числа новых случаев и смертей во время третьей фазы пандемии.

Только полная информация о положительном и отрицательном влиянии медицинских и немедицинских методов профилактики COVID-19, а также его лечения, может помочь в организации эффективных мер по прекращению нынешней пандемии и предотвращению ее повторения в будущем.

Предположительно, имеется несколько причин негативного развития текущей пандемии, включая непрофессиональное управление профилактическими и лечебными мероприятиями, чрезмерное доверие ПЦР-тестам, применение неспециализированных помещений для карантина и лечения, игнорирование профилактического лечения, неадекватное изменение терапевтических протоколов, и снижение индивидуального и коллективного и иммунитета.

Можно предположить, что использование иммуномодулирующих препаратов (экстракты тимуса, пептиды тимуса) у людей со сниженным Т-клеточным иммунитетом, а также переход от стандартных протоколов профилактики и лечения, к индивидуальным, смогли бы ускорить процесс завершения текущей пандемии.

Предпосылки для проведения исследования:

Со времени предыдущего исследования, посвященного коэффициентам смертности, связанной с COVID-19,[1] автор получил много комментариев, которые можно сформулировать в виде вопроса: "Почему не сработал оптимистичный прогноз?" Чтобы ответить на этот вопрос, было проведено новое расширенное исследование, с подробным анализом происходящей пандемии.

1. Введение

1.1. *Начало пандемии COVID-19 и ее текущее состояние*

31 декабря 2019 г. местное отделение ВОЗ в Китае было предупреждено о случаях пневмонии неизвестного происхождения, выявленных в городе Ухань, провинция Хубэй.[2] 3 января 2020 г. был идентифицирована первый полный геном нового коронавируса (2019-nCoVs).[3] 11 февраля 2020 г. новое заболевание было названо "коронавирусная болезнь 2019" или CoViD-19.[4] Дальнейшие исследования показали, что SARS-CoV-2 циркулировал в различных странах, включая Испанию,[5] Италию,[6] Индию,[7] Францию,[8] США,[9] и др. задолго до вспышки эпидемии в Китае.[10-11]

Еще в начале пандемии COVID-19 были опубликованы две хорошо известные статьи, а именно: "Уникальные вставки в шиповидный белок 2019-nCoV" и "Уменьшение числа и функциональное истощение Т-клеток у пациентов с COVID-19".[12-13] Эти исследования продемонстрировали структурное и функциональное сходство между двумя известными вирусами и побудили к естественному обсуждению вопроса о происхождении SARS-CoV-2.[14-15] Вопрос о происхождении вируса возник вновь в декабре 2020 года, когда производство австралийской вакцины было прекращено, поскольку у здоровых вакцинированных людей стал определяться положительный результат теста на ВИЧ.[16]

Кроме того, в процессе развития пандемии возникла целая серия вопросов, связанных с эпидемической кривой, имеющей аномальную динамику, в частности:

(1) *Новая эпидемическая реальность*:

В апреле 2020 г., главный инфекционист Федерального медико-биологического агентства России, Владимир Никифоров, сообщил, что коронавирус не следует канонам классической эпидемиологии и проявляется очень странно ... Если бы вирус следовал классической схеме, то эпидемия завершилась бы в течение трех месяцев, но "мы столкнулись с чем-то новым".[17]

(2) *Изменения данных, опубликованных ранее*:

В течение первой половины пандемии было много случаев корректировки местных данных, которые повлияли на мировую статистику, связанную с COVID-19.[18] (рис. 1)

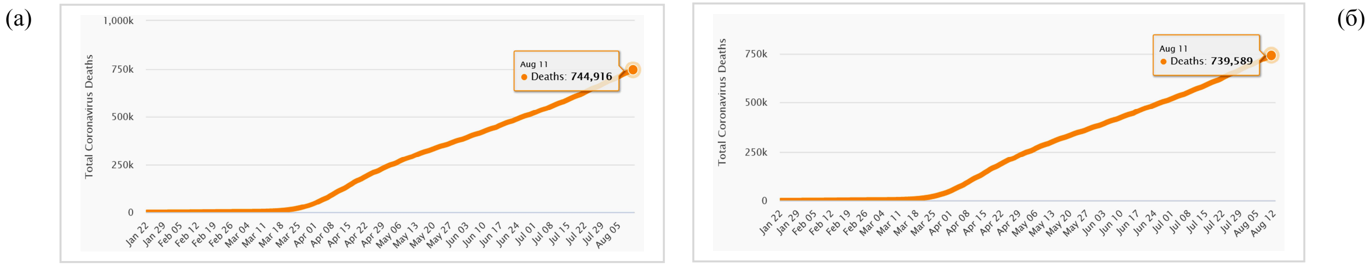


Рисунок 1. Изменение совокупного числа смертей во всем мире.[18]
На рисунке два скриншота: (а) первые датирован 12 августа 2020 года, 07:27 по Гринвичу;
(б) второй - 13 августа 2020 г., 09:18 по Гринвичу.
Общее число смертей в мире сократилось с 744 916 до 739 589 случаев.

17 апреля 2020 года в итоговый отчет Китайской Народной Республики было добавлено 1290 новых смертей, связанных с COVID-19,[18] при этом, китайские представители дали следующее объяснение: "Изменения были внесены в соответствии с имеющимися законами и постановлениями, а также в соответствии с принципом ответственности за историю, народ и людей, умерших от COVID-19".[19]

26 апреля 2020 г. совокупный отчет Палестины был сокращен на 153 случая; 25 мая 2020 г. отчет Испании сократился на 1915 смертей; 3 июня 2020 г. отчет Франции сократился на 37.895 случаев; 20 июня 2020 г. отчет Майотты сократился на 787 случаев; 13 августа 2020 г. отчет Соединенного Королевства сократился на 29.726 случаев и на 5.319 смертей.[18] (рис. 2).

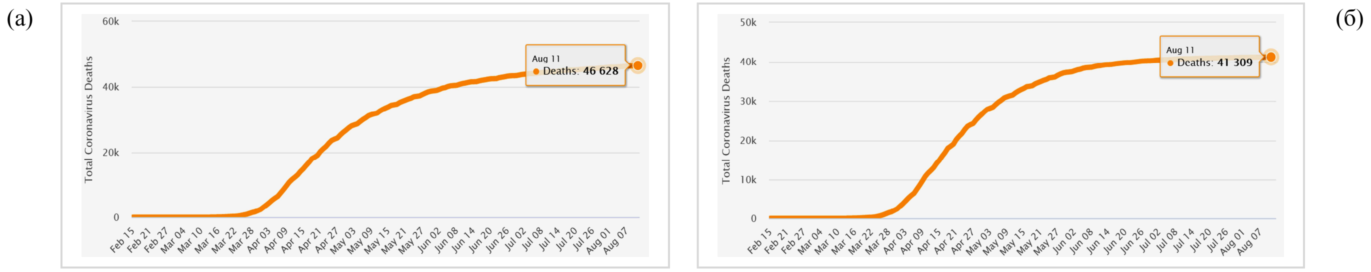


Рисунок 2. Корректировка совокупного числа смертей в Соединенном Королевстве;[18]
(а) первый скриншот датирован 12 августа 2020 года, 07:34 по Гринвичу;
(б) второй - 13 августа 2020 г., 08:19 по Гринвичу.

14 августа 2020 г. в отчете Перу было добавлено 3.935 новых смертей; 21 августа 2020 г. количество умерших в Кыргызстане уменьшилось на 443 случая (рис. 3); 24 сентября 2020 г., отчет Либерии, уменьшился на 133 случая.[18]

Аналогичные изменения отчета произошли и в более поздний период пандемии, например: 2 июля 2021 г. сообщалось, что общее число умерших от COVID-19 в округе Санта-Клара снизилось на 505 случаев,[20] и так далее.

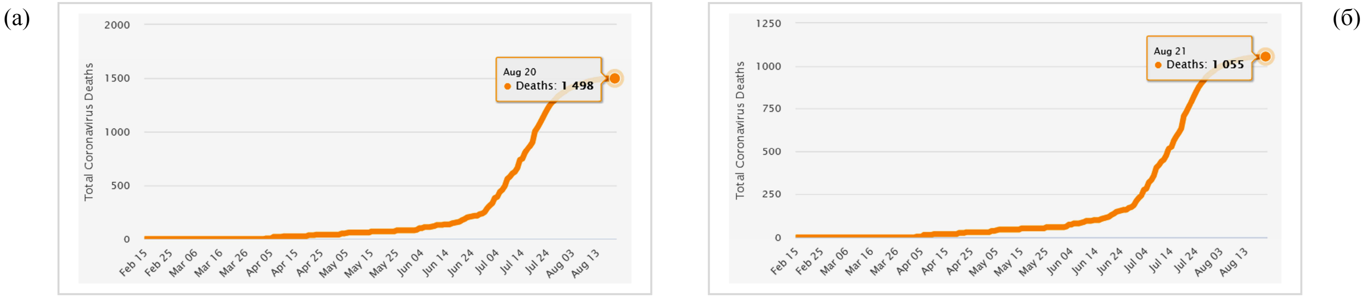


Рисунок 3. Изменение совокупного числа смертей в Киргизии.[18]
(а) Первый скриншот датирован 21 августа 2020 года, 08:21 по Гринвичу;
(б) Второй - 22 августа 2020 г., 08:04 по Гринвичу.

(3) *Явления, напоминающие синхронизацию событий пандемии*:

Одним из примеров синхронизации является недельный цикл смертности.[21] Этот цикл можно обнаружить в отчете Бразилии, Чили, Соединенном Королевстве и Соединенных Штатах Америки, начиная с апреля 2020 года. Позже этот аномальный цикл ежедневной смертности распространился на другие страны. Изучение процента летальных исходов в разные дни недели за период в 100 недель (26.01.20-25.12.21) выявило аналогичное распределение смертности по дням недели, как это было представлено в исследовании, опубликованном в начале 2021 года.[22] (рис. 4).

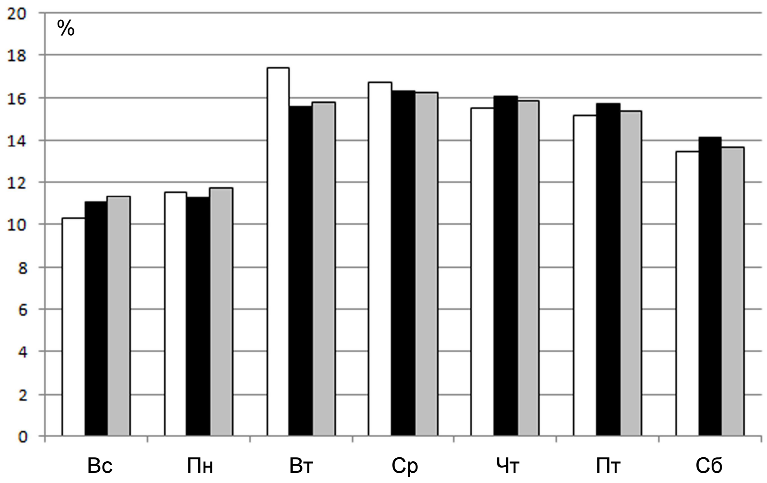


Рисунок 4. Ежедневная смертность от COVID-19 в разные дни недели:
белые столбцы отражают период в 4 недели (05.04.20-02.05.20), в США;
черные столбцы – период в 40 недель (01.03.20-05.12.20) во всем мире;
серые столбцы – период в 100 недель (26.01.20-25.12.21) во всем мире.
По горизонтальной оси – дни недели, по вертикальной оси – проценты.

Другой пример синхронизации связан с ежедневным числом новых случаев COVID-19. За 1,5 года пандемии наибольшее число ежедневных новых случаев в США и Великобритании было зафиксировано в один и тот же день, 8 января 2021 г.; вместе на эти страны пришлось 44% от общего числа новых случаев во всем мире.

(4) *Необычная эволюция пандемии*:

В середине декабря 2021 года известный эксперт по инфекционным заболеваниям, доктор Энтони Фаучи заявил: "*Беспрецедентно*, как долго длится пандемия COVID-19 во всем мире, причем многие страны пережили несколько крупных волн нового инфекционного заболевания, с момента ее объявления, в марте 2020 года".[23]

В связи с удивлением д-ра Э. Фаучи, можно задать закономерный вопрос: почему, несмотря на беспрецедентные меры контроля по предотвращению распространения нового вируса, введенный во многих странах мира, включая карантин, изоляцию, контроль за передвижением, комендантский час, социальное дистанцирование, ношение масок и массовую вакцинацию, эпидемическая кривая по-прежнему имеет волнообразную или прогрессирующую форму, а не идет вниз? Были ли используемые профилактические меры эффективными, или их нужно признать бесполезными, и даже вредными?

1.2. *Инфекционное заболевание – это результат взаимодействия защитных механизмов человеческого организма с вирусами или бактериями*.

История борьбы с различными вирусными и бактериальными инфекционными заболеваниями насчитывает не менее 3-4 тысяч лет. В те далекие времена, врачи, получавшие специальное образование, знали о внешних патогенах, которые могут вызывать острые лихорадочные заболевания. Они также знали, что развитие заболевания в каждом конкретном случае зависело от состояния здоровья пациента до начала заболевания, поэтому они говорили о "защитных механизмах" организма или о "защитной энергии" (*Wei Qi*).[24] В начале формирования современной микробиологии важность резистентности организма подтвердил профессор Макс фон Петтенкофер. Он при свидетелях проглотил содержимое пробирки, наполненной микробами холеры, но при этом с ним ничего не случилось. После этого он заявил, что микробы не играют никакой роли в развитии холеры, а в основе заболевания лежит индивидуальная предрасположенность.[25]

Несмотря на разнообразие внешних возбудителей, организм человека имеет ограниченное количество защитных механизмов, включение которых сопровождается несколькими клиническими синдромами, состоящими из общих, неспецифических симптомов, таких как утомляемость, озноб или ощущение жара, головная боль, кашель, одышка, тошнота, рвота, понос, кожная сыпь или изменение цвета кожи и т. д.

В древности механизмы возникновения лихорадки разделяли на две основные группы в зависимости от наличия жажды, потливости, озноба или ощущение жара; а выбор индивидуального лечения определялся типом лихорадки. Согласно современному взгляду на лихорадку, можно выделить два основных механизма, приводящих к повышению температуры: первый – это увеличение теплопродукции, второй – это снижение теплоотдачи, или, возможно их сочетание.[26] Таким образом, древнее и современные объяснения лихорадки, вероятно, идентичны, и два типа жаропонижающих лекарств необходимы и достаточны для лечения любого случая чрезмерной лихорадки. Аналогичным образом можно выделить 2-3 механизма, лежащих в основе каждого из оставшихся симптомов любого острого вирусного заболевания, поэтому для лечения любых инфекционных заболеваний, включая "старые" и "новые", будет достаточно небольшой группы обычно применяемых препаратов.

После открытия бактерий и вирусов, как причины инфекционных заболеваний, основной акцент был смещен на борьбу с возбудителями, а поддержка резистентности организма оказалась забытой. Этиологическое лечение было успешным в большинстве случаев бактериальной инфекции, но почти бесполезным, когда инфекционное заболевание было вызвано вирусом. Вероятно, если нет специфического этиотропного лечения, то нет особой необходимости в выделении *нового* вирусного заболевания, тем более с идентификацией отдельных штаммов или вариантов. Все медикаментозные и немедикаментозные методы лечения должны быть направлены на поддержку или торможение общеизвестных защитных механизмов человеческого организма. Поэтому, при формировании протокола лечение врач должен ориентироваться не на место заболевания в международной классификации болезней, а на ведущий синдром с использованием принципа, называемого лечением "*не по инструкции*" (*офф-лейбл*; *off-label*), а на основании знаний и опыта врача.

1.3. *Классические основы медицины – это мудрость, которая не подвергается старению.*

Таблицы умножения, теорема Пифагора, закон Архимеда, представления об инерции и атомном строении материи появились несколько тысяч лет назад. В ходе истории древние знания развивались и совершенствовались, пока не превратились в высшую математику и квантовую физику. Однако таблица умножения, закон Архимеда и другие базовые знания не утратили своего значения и в наши дни. Древняя медицина также имела свои каноны, сохранившиеся в рамках традиционной китайской медицины. Важнейшим законом этого канона был постулат: *усиливать или укреплять то, чего недостает, и очищать или успокаивать то, что избыточно.*[27] На протяжении столетий этот постулат принял новую форму и был введен в медицину доктором Джоном Брауном, как теория *стенических* и *астенических* заболеваний.[28] В начале 20 века два физиолога представили этот постулат в виде теорий доминанты и парабиоза.[29-30] В 1930-х годах Ганс Селье открыл динамическое взаимодействие между избыточной и недостаточной реакциями, и описал свое открытие в виде теории общего адаптационного синдрома, который включал фазу тревоги (= избыток, стеническое заболевание, доминанта) и фазу истощения (= дефицит, астеническое заболевание, парабиоз).[31-32]

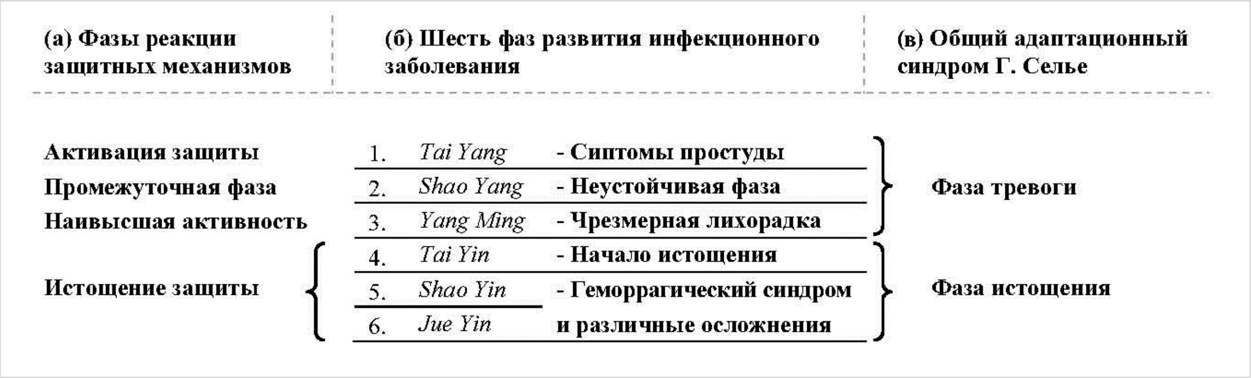
В процессе формирования органотерапии[33-34] врачи начали использовать экстракты органов животных для лечения различных возрастных проблем, называемых в настоящее время 'дряхлостью' (*frailty*).[35-36] Некоторое время спустя от органотерапии отделилась гормонотерапии, которая стала эффективным инструментом для лечения различных заболеваний, вызванных гормональной недостаточностью.[37-38] Оба вида лечения следовали первой части древнего постулата: *усиливать или укреплять то, чего недостает*. Когда были открыты антибиотики, у врачей появился инструмент для подавления роста бактерий.[39] Применение антибиотиков было примером следования второй части древнего постулата: *очищать или успокаивать то, что избыточно*. Однако дальнейшее развитие медицины пошло не по основному канону.

В настоящее время, несмотря на то, что паттерн недостаточности является ведущей причиной большинства хронических заболеваний, особенно у пожилых людей, тем не менее, для терапии используются различные варианты антагонистов, блокаторов или ингибиторов. К ним относятся α-блокаторы, β-блокаторы, блокаторы кальциевых каналов, ингибиторы АПФ, ингибиторы ФДЭ-5, блокаторы H_2-рецепторов, и пр. Перед назначением седативной или блокирующей терапии тесты на физиологическое состояние соответствующих рецепторов-мишеней не проводятся. Таким образом, нарушается принцип патогенетического лечения, в результате чего выздоровление невозможно, а пациент вынужден принимать лекарства в течение всей своей жизни.

Похожая проблема возникла с лечением COVID-19. Главной мишенью для нового вируса (SARS-CoV-2) были пожилые люди с Т-клеточным иммунодефицитом,[13,40-41] тем не менее, чрезмерное внимание было уделено цитокиновому шторму, который был всего лишь следствием, а не причиной прогрессивного течения заболевания. Согласно основному медицинскому канону, лечение должно было быть направлено на восстановление Т-клеточного иммунитета,[42] а не на вторичное повышение активности некоторых компонентов иммунной системы.

1.4. *Лечение больных с острыми инфекционными заболеваниями*

Около 1800 лет назад д-р Чжан Чжунцзин обобщил результаты исследований предыдущих поколений и разработал теорию острых инфекционных заболеваний, которая объясняла терапию на основе ведущих клинических синдромов.[43] Согласно этой теории, прогрессирование заболевание развивается через 6 основных фаз, а некоторые фазы могут иметь 2-3 варианта. Таким образом, все разнообразие клинических синдромов, связанных с инфекционными заболеваниями, сводилось к 10-12 вариантам, каждый из которых имел специфическое лечение и профилактику. (рис. 5.б)



(а) Фазы реакции защитных механизмов	**(б) Шесть фаз развития инфекционного заболевания**			**(в) Общий адаптационный синдром Г. Селье**
Активация защиты	1.	*Tai Yang*	**- Ситпомы простуды**	**Фаза тревоги**
Промежуточная фаза	2.	*Shao Yang*	**- Неустойчивая фаза**	
Наивысшая активность	3.	*Yang Ming*	**- Чрезмерная лихорадка**	
Истощение защиты	4.	*Tai Yin*	**- Начало истощения**	**Фаза истощения**
	5.	*Shao Yin*	**- Геморрагический синдром**	
	6.	*Jue Yin*	**и различные осложнения**	

Рисунок 5. Параллели между различными теориями,
описывающими фазовую эволюцию острых инфекционных заболеваний:
а) Четыре фазы заболевания, вызванного внешними физическими
или биологическими патогенами, объединенными термином "чрезмерный жар".[44]
б) Шесть фаз заболевания, вызванного различными внешними физическими,
химическими или биологическими патогенами.[43]
в) Фазы развития и прогрессирования заболевания согласно теории
общего адаптационного синдрома Ганса Селье.[31-32,45]

Приведем несколько примеров лечения начальной фазы инфекционных заболеваний: при начальной лихорадке с ощущением холода, а также с ознобом, но без потоотделения – рекомендуется использовать отвар травы эфедры (*Herba Ephedrae*); при начальной лихорадке с ощущением жара следует использовать листья белой шелковицы (*Folium Mori Albae*) и перечной мяты (*Herba Menthae Haplocalycis*); при начальной лихорадке с интенсивным потоотделением или напряжением мышц шеи рекомендуется использовать отвар из веточек корицы (*Ramulus Cinnamomi Cassiae*); при лихорадке с чередованием ощущения холода и жара – отвар корней володушки (*Radix Bupleuri*) и т. д.[43] (рис. 5.б). Если происходит изменение симптомов, то это указывает на смену фазы заболевания и требует изменение лечебной прописи. При, устойчивой лихорадке, не купируемой антипиретиками, при лихорадке с кожной сыпью, при геморрагическом синдроме с почечной недостаточностью, делирием и пр., следует применять отвар корней вайды красильной (*Radix of Isatis tinctoria*).[44,46] (рис. 5а).

В последующие века протоколы лечения инфекционных заболеваний обновлялись в соответствии с новыми научными открытиями того времени. За исключением эпидемий, вызванных особо опасными инфекциями, такими, как чума, оспа или холера, лечение большинства инфекционных заболеваний было эффективным и успешным.

Для современной патофизиологии было бы полезно научиться различать типы лихорадок и выбирать жаропонижающие лекарства (например, парацетамол или ибупрофен), исходя из фармакодинамики этих препаратов, а не эмпирически, как это принято делать до настоящего времени.[47]

Теоретически, современная медицина, имеющая долгую историю в прошлом и передовую фармацевтическую науку в наши дни, должна быть в состоянии лечить любую проблему более эффективно, чем наши предшественники. Однако беспомощность глобальной медицинской системы во время текущей пандемии была за гранью здравого смысла,[48] и породила вопросы о качестве медицинского образования, полученного выдающимися руководителями разных уровней, и их подчиненными. Удивительно, но факт, что многие врачебные рекомендации разрабатывались и внедрялись людьми, не имевшими медицинского образования, или не обладавшими достаточными знаниями в области эпидемиологии, и не имевшими опыт лечения инфекционных заболеваний.

1.5. *Лечение COVID-19 в первые месяцы пандемии.*

В начале пандемии ВОЗ рекомендовала врачам, в качестве лечения нового заболевания, использовать известные лекарственные препараты на основании принципа лечения не по инструкции (*off-label*), поскольку еще не было ни одного лекарства, одобренного для лечения COVID-19.[49] Большинство знающих и опытных врачей, получивших качественные медицинское образование, лечило пациентов, страдающих от COVID-19, с высокой эффективностью. Они рекомендовали использовать антикоагулянты, такие как дипиридамол[50] или гепарин,[51] противовирусные и противовоспалительные препараты, включая ивермектин,[52-53] колхицин,[54-55] метиленовый синий,[56-57] хлорохин и гидроксихлорохин,[58-60] иммуномодуляторы, такие как экстракты и пептиды тимуса,[61-62] раствор формальдегида,[63] мелатонин[64] и стандартные адъюванты, включая препараты цинка и витамин Д.[65]

Группа врачей, выявивших сходство между патогенезом COVID-19 и токсическим поражением эритроцитов, рекомендовала использовать терапевтический протокол, который был эффективен в случаях при острой интоксикации.[66] Другие эксперты рекомендовали ингаляции парами этанола,[67-68] и гелий-кислородной смесью,[69] поскольку эти средства уже применялись ранее при подобных состояниях.[70-72] Лекарства растительного происхождения, включая экстракты полыни, вайды или колхицина, зеленый и черный чай, а также сложные сборы успешно применялись, как для профилактики, так и для комплексной терапии.[73-78]

В первые месяцы эпидемии COVID-19 в России, местные врачи использовали свои собственные протоколы лечения, что привело к очень низкой смертности, и вызвало вопросы и скепсис со стороны международного медицинского сообщества.[79-80] Например, в апреле-июне 2020 года, в больницу при Московском Государственном Университете было госпитализировано 424 пациента с COVID-19, из которых успешно было пролечено 420 человек. Эффективность терапии составила около 100%.[81] В качестве основных лекарств российские врачи использовали *колхицин*, *дипиридамол*, *бромгексин* и *спиронолактон*; дополнительное применение антикоагулянтов и кортикостероидов зависело от конкретного случая.[82] Таким образом, для лечения инфекционного заболевания, вызванного *новым* коронавирусом, было достаточно имевшихся медицинских знаний, практического опыта и набора простых лекарств.

Каждый врач знает, что эффективная терапия любого пациента требует индивидуального подхода в связи с естественной разницей даже между двумя похожими случаями, тем более, при лечении пациентов с COVID-19.[83]

В некоторых клинических исследованиях, соблюдение стандартных протоколов лечения без индивидуальной коррекции используемых препаратов и доз, привело к снижению или даже утрате эффективности препаратов, ранее успешно применявшихся другими врачами.[84] Тем не менее знающие врачи продолжали свое эффективное лечение.[65,85-86] Высокая эффективность препаратов, упомянутых выше, была проверена и доказаны в многих клинических испытаниях, а их результаты были опубликованы в рецензируемых журналах.[87]

После недавних дискуссий о терапевтических протоколах, прошедших между различными экспертами, д-р Питер А. Маккалоу рекомендовал своим коллегам лечить пациентов с COVID-19 в соответствии с их собственными знаниями и опытом.[88] К этому можно добавить, что нет смысла в том, чтобы следовать протоколу лечения, подготовленному экспертами или странами, где смертность была высокой. В противном случае аналогичная высокая смертность будет достигнута и среди ваших пациентов.

1.6. *Клинические испытания*

В начале 18 века врачи-гомеопаты, изучавшие патогенез новых лекарственных средств, внедрили в медицинскую практику опыт проведения обширных и многоцентровых клинических испытаний. Как известно, им нужно было выявить различия между первичными и вторичными симптомами, и отделить важные симптомы от второстепенных симптомов. С точки зрения стандарта гомеопатической фармакологии, использование больших групп людей было оправдано. Тем не менее, эти обширные клинические испытания подверглись критике со стороны Рудольфа Вирхова, отца современной патологической анатомии. Он настаивал на том, что, несмотря на определенное сходство в патологических изменениях, обнаруживаемых у разных пациентов с похожим заболеванием, тем не менее, у каждого из них есть свое особое заболевание, отличающееся своим течением от заболевания у других пациентов. Поэтому вместо того, чтобы использовать статистику, собранную на больших группах людей, врачам следует уделять больше внимания подробному анализу каждого конкретного случая.[89]

Что касается острых инфекционных заболеваний, то их патологическое состояние не является стабильным, но имеет несколько фаз, и каждая фаза требует применения различных лекарственных средств и ухода за пациентом. Было бы нелогично искать универсальное лечение COVID-19 в целом, но каждая фаза заболевания требует своих соответствующих групп лекарств, и врачу нужно выбрать один или два препарата с учетом основных симптомов, имеющихся у конкретного пациента. Многократные попытки найти уникальное лекарство от "COVID-19" не увенчались успехом. Это означает, что лечение COVID-19 или любых других новых острых вирусных инфекционных заболеваний должно проводиться с помощью обычных лекарственных препаратов, применяемых в качестве терапии *не по инструкции* (*off-lable*).

Когда "COVID-19" был выделен в отдельное заболевание,[4] перед здравоохранением всего мира встала задача по проведению новые клинических испытаний и разработке лечения, которое было бы эффективным и безопасным в группе больных с COVID-19, и в том числе, для имеющих сопутствующие заболевания. После того как д-р Т. А. Гебрейесус высказал предположение о начале пандемии,[48] все пациенты с подозрением на заражение вирусом SARS-CoV-2 оказались участниками самых масштабных клинических испытаний, когда-либо проводимых в истории человечества.

Поскольку почти все патогенетические механизмы, встречающиеся при COVID-19, стали известны еще до апреля 2020 года, поэтому лечение COVID-19 не должно было представлять особых затруднений.

Более того, поскольку многие рутинные препараты уже успешно применялись с начала пандемии, поэтому основной целью дальнейших клинических испытаний должна была стать разработка эффективных и адаптируемых протоколов лечения, а не опровержение эффективности применявшихся ранее лекарств. В испытаниях также проверялась способность врачей формировать однородные группы с учетом ведущих патогенетических механизмов и основного терапевтического действия изучаемого препарата. К сожалению, многие клинические испытания продемонстрировали недостаточные знания и отсутствие опыта у врачей, проводивших исследования.

Для знающего врача, имеющего необходимый опыт практической работы, клинические испытания, в принципе, не нужны. Если врач знает этиологию и патогенез заболевания, а также фармакодинамику используемых препаратов, то в каждом конкретном случае эффективность лечения должна приближаться к 100%. Однако результаты клинических испытаний очень важны и полезны для начинающих врачей, так как стандартизация протоколов помогают им уменьшить вероятность побочных эффектов, которые могут быть вызваны лечением, проводимым без достаточных знаний.

1.7. *Парадоксы клинических испытаний*

Анализ некоторых фактов позволяет обнаружить причины высокой смертности в отдельных странах, имевшей место на начальном этапе пандемии COVID-19.

В январе-апреле 2020 г. смертность среди больных CoViD-19, получавших инвазивную искусственную вентиляцию легких (ИВЛ), превышала 80%, в том числе 81%,[90] 88,1%,[91] 92%,[92] и даже 97%.[93] По данным обзора, проведенного *G. Bellani и соавт.* (2016), самая высокая смертность среди самых тяжелых пациентов с острым респираторным дистресс-синдромом (ОРДС) различного генеза, получавших ИВЛ, была менее 51%.[94] Сравнив результаты применения ИВЛ у пациентов с COVID-19 с результатами, представленными в обзоре по ИВЛ (2016 г.), можно сделать вывод, что ИВЛ не имеет лечебного эффекта у пациентов с ОРДС, вызванным SARS-CoV-2. Отсутствие терапевтического эффекта ИВЛ объясняется системным эндотелиитом и коагулопатией, которые приводили к микро- и макро-тромбозам в различных органах, в том числе в легких.[95] Тем не менее, ИВЛ по-прежнему используется для лечения ОРДС у пациентов с COVID-19, приводя к новым жертвам среди этих больных.

С самого начала пандемии COVID-19 было известно, что группа высокого риска, состояла, в основном, из пожилых людей с ослабленным иммунитетом и сопутствующими заболеваниями. Основным параметром, который мог указывать на риск тяжелого течения заболевания, была лимфопения.[93] Прогностически неблагоприятными признаками COVID-19 были: снижение количества лимфоцитов в целом, уменьшение субпопуляций Т-лимфоцитов (CD4+, CD8+) и, как следствие, дисфункция В-лимфоцитов и нарушение регуляции продукции ими Ig-M и Ig-G. Количество Т-лимфоцитов, в том числе CD4+ и CD8+, было особенно низким среди пациентов, которые нуждались в лечении в отделении интенсивной терапии.[13] Тяжесть течения COVID-19 и его исход, в значительной степени, зависели от возраста пациента, при увеличении которого, наблюдалось снижение количества Т-лимфоцитов, вызванное возрастной атрофией тимуса.[40,96] Риск госпитализации из-за COVID-19 экспоненциально возрастает с возрастом, обратно пропорциональный продукции Т-клеток.[41] У пациентов с COVID-19 часто наблюдалось реактивное увеличение размеров тимуса, и продукции Т-лимфоцитов, что, по-видимому, является полезной адаптацией к вирус-индуцированной лимфопении. Потеря способности тимуса к реактивации может приводить к ухудшению прогноза.[97]

Несмотря на большое значение иммунологической дисрегуляции, вызванной дефицитом Т-клеток, было проведено всего лишь несколько исследований с применением препаратов, полученных из тимуса,[42,61,98] хотя, иммуномодулирующие и защитные эффекты экстракта тимуса известны уже более двухсот лет.[99]

16 июня 2020 г. профессор Питер Хорби заявил, что на данный момент дексаметазон является единственным препаратом, который достоверно снижает смертность у больных COVID-19.[100] П. Хорби утверждал, что в группе пациентов, которым проводилась инвазивная механическая вентиляция легких, произошло снижение смертности на одну треть; а у пациентов, получавших кислород без инвазивной механической вентиляции – на одну пятую; тем не менее, дексаметазон не снизил смертность у пациентов, не получавших кислород или ИВЛ.[101] Выводы более позднего исследования были менее оптимистичными, в частности: "Нет никаких доказательств того, что кортикостероиды безопасны и эффективны у пациентов с COVID-19".[102]

Ключевым звеном этих противоречивых утверждений был не адекватный подход к использованию кортикостероидов. При наличии инфекционного или не инфекционного заболевания, кортикостероиды следует рекомендовать больным в качестве заместительной терапии, когда, согласно теории общего адаптационного синдрома Г. Селье, организм больного находится в фазе истощения.[31-32,45] (рис. 5в) Поэтому, определение уровня кортизола и альдостерона должно входить в обязательный набор рутинных анализов, проводимых перед назначением терапии кортикостероидами, тем более, в случае больного COVID-19.

1.8. *Коэффициент смертности и коэффициент смертности от инфекции*

Существуют две наиболее важные характеристики инфекционных болезней: первая – это коэффициент смертности (CFR – *case fatality ratio*), а вторая – коэффициент смертности от инфекции (IFR – *infectious fatality ratio*).

Коэффициент смертности – это соотношение между числом пациентов, умерших от COVID-19, и числом подтвержденных случаев COVID-19, а коэффициент смертности от инфекции – это соотношение между числом пациентов, умерших от COVID-19, и числом предполагаемых случаев заражения SARS-CoV-19.[103]

Для выявления распространения SARS-CoV-2 среди населения, проводились специальные тесты, в частности, полимеразная цепная реакция (ПЦР), позволяющая определить наличие частиц вирусного генома, и тест на специфические антитела к вирусу SARS-CoV-2 (IgM и IgG).

В связи с тем, что ПЦР тест дает положительные результаты в течение ограниченного времени после заражения, а специфические антитела вырабатываются и циркулируют в крови инфицированного человека от нескольких месяцев до года,[104-105] поэтому процент обнаруживаемых серопозитивных случаев всегда будет ниже, чем на самом деле. Вследствие этого, значение коэффициента смертности от инфекции всегда будет завышено.

В исследовании, опубликованном *J. Ioannidis* (2020), на конец октября 2020 г. число инфицированных во всем мире достигло 10%.[106] Аналогичный процент инфицирования был рассчитана для Бельгии, Бразилии и США в октябре 2020 г.[107] В декабре 2020 г. число инфицированных в США оценивалось в 50 миллионов человек, что составляло около 15 %.[108]

29 января 2021 года, мэр города Москвы, Сергей Собянин заявил, что не менее половины жителей Москвы переболели COVID-19, и выздоровели.[109] Эта оценка была основана на исследовании, в ходе которого у тысячи здоровых жителей Москвы, выбранных случайным образом, был взят анализ крови, и в более чем половине образцов были обнаружены антитела к SARS-CoV-2. Мэр Москвы призвал переболевших людей не спешить с вакцинацией.[110]

Таким образом, можно сделать вывод, что с начала пандемии большая часть населения крупных городов уже была инфицирована SARS-CoV-2, и у них должно быть некоторое количество циркулирующих антител или память об новом вирусе, хранящаяся в Т-лимоцитах.[111-113]

1.9. *База данных для исследования была собрана на сайте Worldometer*

Информация относительно числа случаев и смертей от COVID-19 доступна на вебсайте Worldometer, начиная с 21 января 2020 г.[18] (рис. 6).

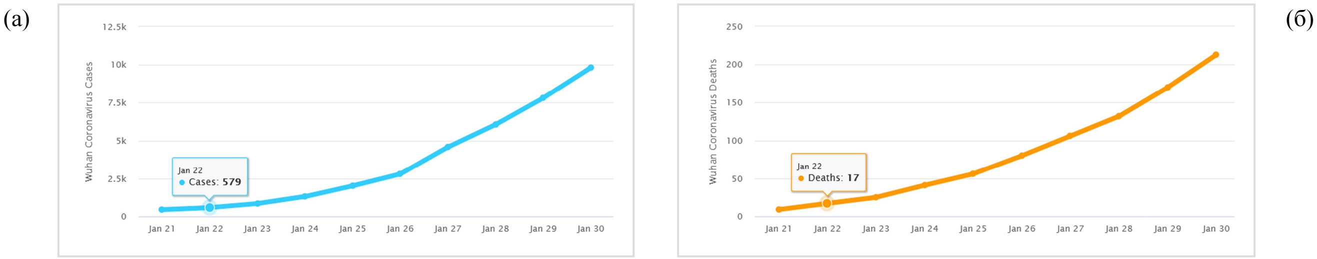


Рисунок 6. Общие числа: (а) случаев заболевания COVID-19 и (б) смертей от COVID-19.
[Скриншот сайта Worldometer от 31 января 2020 г., в 21:35 по Гринвичу]
21 января 2020 г. – это первая дата, представленная на интерактивном графике.
Подсчет ежедневных параметров возможен с 22 января 2020 г.

23 января 2020 г. была опубликована противоречивая статья об использовании ПЦР тестов для выявления больных COVID-19,[114] и в этот же день, в Давосе состоялась историческая сессия Всемирного экономического форума, посвященная уханьскому коронавирусу.[115] Несмотря на то, что, по мнению представителей ВОЗ, повода для беспокойства пока еще не было,[116] тем не менее, дата 23 января 2020 г. была выбрана первым днем текущего исследования.[*]

Для общего и детального анализа пандемии COVID-19, полтора года были разделены на три фазы: (23.01.20-22.07.20), (23.07.20-22.01.21) и (23.01.21- 22.07.21). Было собрано 23 набора баз данных, датированных 22-м числом каждого месяца с января 2020 года по ноябрь 2021 года. Всего исходные данные включали более 20.000 цифр. В исследовании использовались только простые расчеты, доступные в *MS Excel* и понятные рядовому практикующему врачу.

Базы данных, относящиеся к каждому месяцу для каждой страны, были рассчитаны путем вычитания данных предыдущего месяца из данных анализируемого месяца. Например, в Китае на 22.02.20 было 76.923 случая COVID-19 и 2.441 летальный исход, а на 22.01.20 - 571 случай и 17 летальных исходов. Вычитая из первого второе, получаем, что с 23.01.20 по 22.02.20 было 76.352 заболевших COVID-19 и 2.424 умерших, и так далее. Этот же метод использовался для подсчета базы данных, относящихся к каждой фазе для каждой страны. Поскольку в первой фазе COVID-19 затронул только 213 стран,[†] поэтому только эти страны были анализируемы в ходе всего исследования.

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[*] 23 января 2020 года скоропостижно скончался доктор Питер Салама (*Peter Salama*), эксперт в области эпидемиологии, бывший директор Программы ВОЗ по чрезвычайным ситуациям в области здравоохранения, организовавший успешную борьбу с вирусом Эбола в Демакратической Республике Конго.[117]

[†] Здесь и далее под *странами* подразумеваются *страны* и *территории*.

2. Полтора года пандемии COVID-19: коэффициент смертности и коэффициент смертности от инфекции

Цель исследования

Оценить коэффициент смертности и коэффициент смертности от инфекции в 213 странах за полтора года пандемии COVID-19.

2.1. Расчет коэффициента смертности среди пациентов с COVID-19 в 213 странах

Материалы и методы

Для расчета коэффициента смертности (CFR) и коэффициента смертности от инфекции (IFR) на сайте Worldometer были собраны базы данных 213 стран по состоянию на 22 июля 2021 года, 23:49 по Гринвичу. В этих странах зарегистрировано 193.348.564 случая заболеваний COVID-19, и 4.150.526 смертей из-за COVID-19. Коэффициент смертности рассчитывался путем деления числа умерших на число подтвержденных случаев.

Результаты исследования

Общий коэффициент смертности для 213 стран, подсчитанный путем деления числа смертей (n = 4.150.526) на количество подтвержденных случаев (n = 193.348.564), составил 2,147 %.

2.2. Расчет коэффициента смертности среди пациентов с COVID-19 из 175 стран

Материалы и методы

Для повышения однородности основной группы исследования из дальнейшего анализа были исключены 38 стран с числом смертей менее 50. Таким образом, основная группа исследования сократилась до 175 стран с общей численностью населения 7.734.426.580 человек.

В этих странах было зарегистрировано 193.207.132 подтвержденных случая и 4.149.944 летальных исхода. Для каждой страны коэффициент смертности был рассчитан путем деления количества смертей на количество подтвержденных случаев.

Результаты исследования

Общий коэффициент смертности для 175 стран составил 2,148 %. В этой группе коэффициент смертности варьировал от 0,267 % в Катаре до 19,597 % в Йемене, а его среднее значение составило 2,146±1,965 %.

На основании рассчитанных значений коэффициента смертности все страны были разделены на 16 групп, как показано на рис. 7.

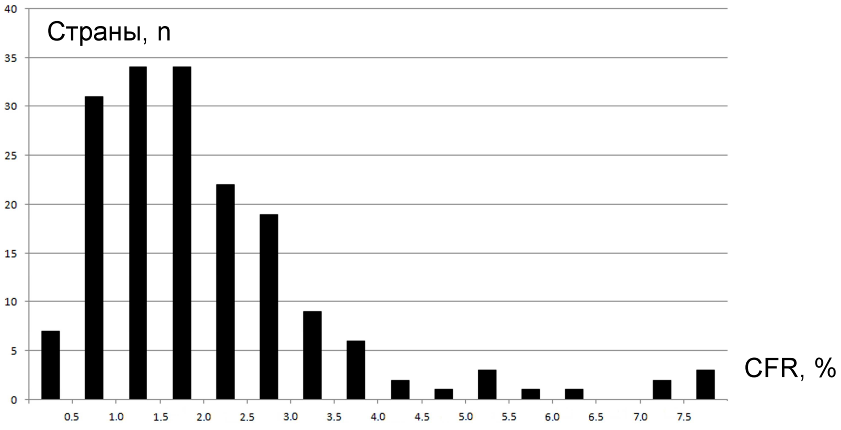

Рисунок 7. Распределение 175 стран по 16 группам в зависимости от значения CFR
1) CFR < 0,5%, n=7; 2) 0,5-1,0%, n=31; 3) 1,0-1,5%, n=34; 4) 1,5-2,0%, n=34;
5) 2,0-2,5%, n=22; 6) 2,5-3,0%, n=19; 7) 3,0-3,5%, n=9; 8) 3,5-4,0%, n=6;
9) 4,0-4,5%, n=2; 10) 4,5-5,0%, n=1; 11) 5,0-5,5%, n=3; 12) 5,5-6,0%, n=1;
13) 6,0-6,5%, n=1; 14) 6,5-7,0%, п=0; 15) 7,0-7,5%, n=2; 16) CFR>7,5%, n=3
По горизонтальной оси – CFR (%), по вертикальной оси - количество стран (n).

В первую группу (n=7), где к CFR был менее 0,50 %, вошли Катар (0,267 %), Мальдивы (0,285 %), ОАЭ (0,286 %), Кипр (0,418 %), Сейшельские острова (0,490 %), Монголия (0,495 %) и Вьетнам (0,498 %).

В группы № 9-16, где CFR превышал 4,00 %, вошли 13 стран: Болгария (4,296 %), Афганистан (4,432 %), Босния и Герцеговина (4,710 %), Китай (5,017 %), Тайвань (5,042 %), Сомали (5,151%), Египет (5,801%), Эквадор (6,415%), Сирия (7,370%), Судан (7,475%), Мексика (8,807%), Перу (9,316%) и Йемен (19,597%).

Выводы

Расчеты, проведенные в данном разделе, показали, что в 38 из 175 стран CFR был менее 1,00%, в 68 странах CFR варьировался от 1,00% до 2,00%, а в 69 странах CFR превысил 2,00%. В 7-ми из 175 стран CFR был менее 0,50%.

2.3. Расчет коэффициент смертности среди пациентов из 38 стран, исключенных из основного исследования

Материалы и методы

В группу стран, исключенных из основного исследования, вошли 8 стран без смертельных случаев, и 30 стран, где число смертей было менее 50.

В 30 странах с общей численностью населения 102.945.260 человек было 140.853 случая COVID-19 и 582 случая смерти, вызванных COVID-19. CFR был рассчитан для каждой страны.

Результаты исследования

В 18 из 30 стран CFR был менее 1,00% (включая 10 стран, где CFR был менее 0,50%); в 8 странах CFR варьировал между 1,00% и 2,00%, а в 4 странах CFR был более 2,00%. Поскольку в 8 странах не было смертей, связанных с COVID-19, поэтому коэффициент смертности был равен нулю, следовательно, он был менее 1,00% и менее 0,50%.

Выводы

Если обобщить расчеты, сделанные в разделах 2.2 и 2.3, то в 64 из 213 стран CFR был менее 1,00%; в 76 странах CFR варьировал от 1,00 до 2,00%; а в 73 странах CFR превысил 2,00%. В 25 из 213 стран CFR был менее 0,50%.

2.4. Расчет коэффициент смертности от инфекции среди пациентов из 136 стран

Предпосылки для исследований

Перед расчетом коэффициента смертности от инфекции предполагалось, что каждый человек был протестирован только один раз, а распределение инфицированных среди всего населения было равномерным. Поэтому ожидалось, что число инфицированных будет увеличиваться прямо-пропорционально увеличению количества проведенных новых тестов.

Общее количество инфицированных людей (Инф) было получено путем деления общего числа подтвержденных случаев (Сл) на общее количество проведенных тестов (Т) и умножения на общую численность населения (Н). Затем был рассчитан коэффициент смертности от инфекции (IFR) путем деления числа смертей от COVID-19 (См) на оценочное число людей, инфицированных вирусом SARS-CoV-2. В предыдущем исследовании[1] для оценки числа инфицированных людей использовалась формула {Инф=Сл•Н/Т}, при этом предполагалось, что результаты расчета коэффициента смертности от инфекции {IFR=См/Инф•Н} будут завышены. Дальнейшее сравнение результатов, рассчитанных по этой формуле, с результатами, представленными в других исследованиях,[106-108] выявило согласованность результатов с разницей, примерно в 1,8 раза; таким образом, исправленная формула выглядит следующим образом {Инф = (Сл•Н/Т)•1,8}. Скорректированная формула, используемая в настоящем исследовании, была {IFR = [(См•Т)/(Сл•Н)]/1,8.

Материалы и методы

После сбора баз данных, страны, где было менее 50 случаев смертей, а также страны, где не было данных о количестве проведенных тестов на SARS-CoV-2, и страны, где количество проведенных тестов превысило общую численность населения, были исключены из основной группы исследования.

В основную группу вошло 136 стран с общей численностью населения 6.864.034.602 человека. Всего было 121.373.035 подтвержденных случаев, 2.768.774 летальных исходов, связанных с COVID-19, и было проведено 1.370.764.127 тестов на COVID-19. Для расчета числа инфицированных использовалась формула {Инф=(Сл•Н/Т)•1,8}. Для расчета коэффициента смертности от инфекции по каждой стране использовалась формула {IFR = [(См•Т)/(Сл•Н)]/1,8}.

Результаты исследования

Поскольку после проведения 1.370.764.127 тестов было выявлено 121.373.035 случаев COVID-19, то можно ожидать, что если количество тестов достигнет числа всего населения (6.864.034.602), то количество инфицированных людей увеличится до 1.093.985.210 человек. Значение общего коэффициента смертности от инфекции для 136 стран {IFR = [(2.768.774•1.370.764.127)/(121.373.035•6.864.034.602)]/1,8} = 0,253%.

Среди 136 проанализированных стран IFR варьировал от 0,003% в Демократической Республике Конго (минимальное значение) до 2,340% в Перу (максимальное значение). На основании оценочных значений IFR все анализируемые страны были разделены на 16 групп, как показано на рис. 8.

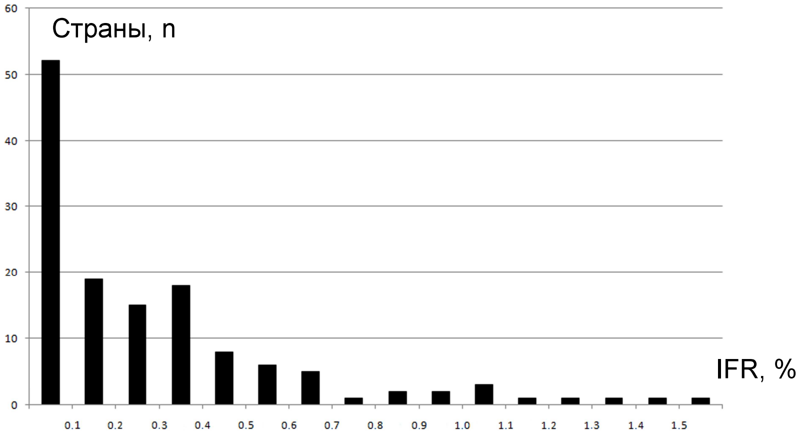

Рисунок 8. Распределение 136 стран по 16 группам в зависимости от значения IFR
1) IFR < 0,10%, n=52; 2) 0,10-0,20%, n=19; 3) 0,20-0,30%, n=15; 4) 0,30-0,40%, n=18;
5) 0,40-0,50%, n=8; 6) 0,50-0,60%, n=6; 7) 0,60-0,70%, n=5; 8) 0,70-0,80%, n=1;
9) 0,80-0,90%, n=2; 10) 0,90-1,00%, n=2; 11) 1,00-1,10%, n=3; 12) 1,10-1,20%, n=1;
13) 1,20-1,30%, п=1; 14) 1,30-1,40%, n=1; 15) 1,40-1,50%, п=1; 16) IFR > 1,50%, n=1.
По горизонтальной оси – IFR (%), по вертикальной оси - количество стран (n).

В первую, наибольшую группу с самым низким значением IFR (<0,10%), вошли 52 страны. Некоторые из этих стран имели население около 100 млн. и более, например, Пакистан (225.392.516; 0,088%), Нигерия (211.492.907; 0,008%), Бангладеш (166.414.749; 0,040%), Эфиопия (117.947.327; 0,022%), Египет (104.359.775; 0,095%); Вьетнам (98.259.748; 0,033%). Другие страны этой группы имели небольшую численность населения, например, Сейшелы (98.988; 0,059%), Французская Полинезия (282.617; 0,039%), Реюньон (902.035; 0,049%), Экваториальная Гвинея (1.451.181; 0,090%) и т.д.

В группы № 11-16 с высокими значениями IFR (>1,00%) вошло 8 стран: Словакия (1,001%), Канада (1,030%), Германия (1,065%), Чили (1,134%), Болгария (1,207%), Венгрия (1,343%), Австралия (1,425%) и Перу (2,340%).

Выводы

Расчеты, проведенные в этом разделе, показали, что в 128 из 136 стран IFR был ниже 1,00 %, в 7 странах IFR варьировал между 1,00 и 2,00 % и только в 1 стране IFR превысил 2,00 %. В 112 из 136 стран IFR был менее 0,50 %.

2.5. Расчет коэффициента смертности от инфекции в 77 странах, исключенных из основного исследования

Материалы и методы

Для оценки коэффициента смертности от инфекции в 52 странах (5 стран без данных о количестве тестов, и 47 стран, где количество выполненных тестов превысило общую численность населения), было рассчитано соотношение между средним значением IFR и средним значением CFR в основной группе стран. Для этого основная группа (n=136) была разделена на 4 подгруппы: (1-я) CFR менее 1,00%, N=24; (2-я) CFR от 1,00 до 2,00%, N=50; (3-я) CFR от 2,00 до 3,00%, N=35; и (4-я) CFR был выше 3,00%, N=27.

Для каждой из этих подгрупп были рассчитаны коэффициенты между средним значением CFR и средним значением IFR: (1-я) CFR/IFR=4,369; (2-я) CFR/IFR=5,991; (3-я) CFR/IFR=7,565; (4-я) CFR/IFR=11,586. Эти четыре коэффициента использовались для расчета IFR в группе из 52 стран, упомянутых выше.

В группе стран (n=17), где количество выполненных тестов было выше нуля, но меньше населения, а число умерших было менее 50 человек, IFR рассчитывался по формуле IFR = [(См • Т)/(Сл • Н)]/1.8, которая уже использовалась в разделе 2.4.

Результаты исследования

В 47 странах, без наличия данных о количестве выполненных тестов, и в 5 странах, где количество проведенных тестов превышало общую численность населения, расчетное значение IFR было менее 1,00%, в том числе, в 51 стране, значение IFR было менее 0,50 %.

Во всех странах, где количество смертельных случаев было менее 50 (n=17), значение IFR было менее 1,00 %; включая 14 стран, где значение IFR было менее 0,50%. В 8 странах, где не было смертельных случаев, значение IFR было равно нулю, то есть менее 1,00% и менее 0,50%.

Выводы

Расчеты, проведенные в разделах 2.4 и 2.5, показали, что в 205 из 213 стран значение IFR было менее 1,00 %; в 7 странах значение IFR варьировало между 1,00% и 2,00%; и только в 1 стране значение IFR превысило 2,00 %. В 185 странах из 213 значение IFR было менее 0,50 %.

Учитывая результаты исследования, проведенного в январе 2021 г., когда 50 % населения Москвы уже имели антитела к SARS-CoV-2,[109-110] можно предположить, что в июле 2021 г. процент людей, уже перенесших COVID-19, должен быть выше, и, следовательно, значение коэффициента смертности от инфекции должно быть ниже, чем рассчитано в текущем исследовании.

2.6. Динамика основных параметров пандемии в течение 22 месяцев

Эпидемическая кривая текущей пандемии имеет волнообразную форму с постепенным увеличением и уменьшением дневных, недельных и месячных цифр, связанных с заболеваемостью и смертностью. Для понимания закономерностей глобального процесса необходимо провести анализ динамики параметров пандемии для каждой страны в отдельности.

Материалы и методы

Было собрано 23 набора баз данных, датированных 22 числом каждого месяца с января 2020 года по ноябрь 2021 года. Общее количество случаев COVID-19, смертей от COVID-19, проведенных тестов и динамика населения представлены в таблице 1. Для каждой даты были рассчитаны такие параметры, как CFR, IFR, а также количество случаев на 1 миллион (Сл/М) и смертей на 1 миллион (См/М) (Таблица 1). Динамика CFR и IFR представлена на рис. 9.

Таблица 1. Динамика основных параметров пандемии COVID-19 за 22 месяца исследования

#	Даты	Случаи	Смерти	Тесты	Население	CFR	IFR	Сл/М	См/М
0	22.01.20	579	17	-	-	2,936	-	-	-
1	22.02.20	78.001	2.457	-	-	3,150	-	-	-
2	22.03.20	334.886	14.603	-	-	4,361	-	-	-
3	22.04.20	2.632.559	183.879	23.282.447	-	6,985	-	-	-
4	22.05.20	5.296.813	339.374	67.673.680	7.749.928.184	6,407	0,031	683	44
5	22.06.20	9.176.001	473.406	130.810.378	7.756.390.179	5,159	0,048	1,183	61
6	**22.07.20**	**15.362.745**	**625.395**	**302.374.544**	**7.762.530.924**	**4,071**	**0,088**	**1,979**	**81**
7	22.08.20	23.358.160	807.665	409.774.283	7.768.876.378	3,458	0,101	3,007	104
8	22.09.20	31.750.352	974.050	609.767.516	7.775.221.824	3,068	0,134	4,084	125
9	22.10.20	41.959.098	1.142.057	759.449.532	7.781.362.578	2,722	0,148	5,392	147
10	22.11.20	58.947.048	1.392.963	955.296.514	7.787.708.023	2,363	0,161	7,569	179
11	22.12.20	78.280.842	1.721.802	1.164.332.290	7.793.848.775	2,200	0,183	10,044	221
12	**22.01.21**	**98.669.593**	**2.113.750**	**1.375.887.509**	**7.800.194.225**	**2,142**	**0,210**	**12,650**	**271**
13	22.02.21	112.239.378	2.484.426	1.589.416.906	7.806.539.667	2,214	0,250	14,378	318
14	22.03.21	124.265.956	2.734.688	1.805.314.644	7.812.271.038	2,201	0,283	15,907	350
15	22.04.21	145.297.992	3.083.902	2.087.974.472	7.818.616.492	2,122	0,315	18,584	394
16	22.05.21	167.027.095	3.467.994	2.378.274.484	7.825.090.334	2,076	0,350	21,345	443
17	22.06.21	179.871.406	3.896.149	2.660.800.034	7.831.231.088	2,166	0,409	22,968	498
18	**22.07.21**	**193.348.564**	**4.150.533**	**2.926.443.254**	**7.837.371.840**	**2,147**	**0,445**	**24,670**	**530**
19	22.08.21	212.552.947	4.443.846	3.218.070.808	7.843.921.989	2,010	0,477	27,098	567
20	22.09.21	230.824.305	4.731.461	3.598.394.533	7.850.062.735	2,050	0,522	29,404	603
21	22.10.21	243.676.239	4.952.263	3.889.118.661	7.856.203.486	2,032	0,559	31,017	630
22	22.11.21	258.262.254	5.172.861	4.212.580.383	7.862.548.934	2,003	0,596	32,847	658

Результаты исследования

За 22 месяца пандемии произошло увеличение общего числа случаев, смертей и проведенных тестов на COVID-19, а также рост населения во всем мире.

Сравнение данных, собранных 22 января 2021 г. (12 месяцев или 1 год) и 22 июля 2021 г. (18 месяцев или 1,5 года), показало, что за последние шесть месяцев параметры пандемии почти удвоились по сравнению с аналогичными параметрами, собранными за предыдущий год. Количество заболевших и умерших от COVID-19 увеличилось в 1,96 раза, а количество тестов – в 2,13 раза.

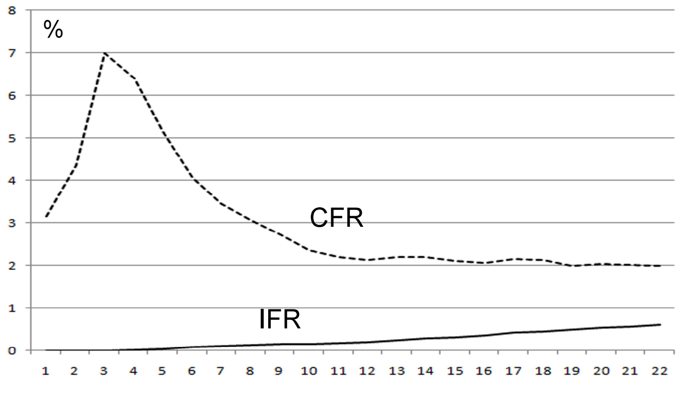

Рисунок 9. Динамика CFR и IFR за 22 месяца пандемии COVID-19.
По горизонтальной оси – номера месяцев, по вертикальной оси - %.

Значение CFR, рассчитанное на основании числа подтвержденных случаев и смертей, накопленных за предыдущее время пандемии, было самым высоким в апреле и мае 2020 года, после чего последовала тенденция к снижению. Значение IFR постепенно и непрерывно увеличивалось (рис. 9).

Выводы

За последние 6 месяцев из анализируемых 1,5 лет пандемии, резко возросло число случаев COVID-19, смертей, вызванных COVID-19, и тестов, проведенных с целью выявления заражения SARS-CoV-2.

Для более детального анализа этой негативной тенденции 1,5 года были разделены на 3 фазы: 1-я фаза (23.01.20-22.07.20), 2-я фаза (23.07.20-22.01.21) и 3-я фаза (23.01.21-22.07.21), которые будут проанализированы в следующем разделе.

3. Три фазы пандемии COVID-19.

За шесть месяцев 3-й фазы пандемии (23.01.21-22.07.21) число случаев, смертей и анализов было почти таким же, как и за предыдущий год (23.01.20-22.01.21).

Цель исследования

Проанализировать и сравнить динамику количества новых случаев COVID-19, заболеваемости, смертей и проведенных тестов в течение трех фаз пандемии.

Материалы и методы

Анализ трех фаз пандемии COVID-19 был разделен на две части. В первой части был проведен общий анализ по 213 странам, а во второй части – анализ каждой страны по отдельности.

3.1. Общий анализ трех фаз пандемии COVID-19 в 213 странах

Материалы и методы

На сайте Worldometer были собраны четыре базы данных, датируемые 22.01.20, 22.07.20, 22.01.21 и 22.07.21.

Количество случаев, смертей и тестов, относящихся к каждой фазе для каждой из 213 стран, было рассчитано путем вычитания данных предыдущей фазы из данных анализируемой фазы. Например, на 22.01.21 всего было 98.669.593 случая COVID-19, 2.113.750 смертей, и 1.375.887.509 тестов; а на 22.07.21 было 193.348.564 случая COVID-19, 4.150.533 смерти и 2.926.443.254 теста. Вычитая первые числа (от 22.01.21) из вторых (от 22.07.21), получаем, что за 6 месяцев, с 23.01.21 по 22.07.21, было 94.678.971 новых случаев COVID-19, 2.036.783 новых смертей и 1.550.555.745 новых тестов, и т.д. Значения CFR были рассчитаны для каждой фазы.

Кроме того, был проведено расчет соотношения между случаями, смертями и тестами, зарегистрированными в течение 1-й, 2-й и 3-й фаз, по отношению к аналогичным параметрам, зарегистрированным в течение всего периода в полтора года. Дополнительно был проведен расчет соотношений между случаями, смертями и тестами, зарегистрированными в течение 12 месяцев первого года пандемии, по отношению к аналогичным показателям, зарегистрированным в течение полутора лет. (Таблица 2).

Результаты исследования

Согласно проведенным расчетам, 3-я фаза характеризовалась резким ростом всех параметров пандемии, включая числа новых случаев COVID-19, смертей из-за COVID-19, и проведенных тестов. Рост числа тестов превзошел рост числа новых случаев и смертей. Коэффициент смертности был самым высоким в 1-й фазе, затем снизился во 2-й фазе и вновь увеличился в 3-й фазе.

Таблица 2. Количество случаев COVID-19, смертей и тестов, относящихся к различным фазам. Количество случаев, смертей и тестов, зарегистрированное в течение первых 12 месяцев (1 год, фазы I+II) и всего периода анализа в 18 месяцев (1,5 года, фазы I+II+III).

Фазы, #	Даты	Случаи	%	Смерти	%	Тесты	%	CFR,%
I	23.01.20-22.07.20	15.362.166	7,94	625.378	15,07	302.374.544	10,33	4.071
II	23.07.20-22.01.21	83.306.848	43,09	1.488.355	35,86	1.073.512.965	36,68	1.787
III	23.01.21-22.07.21	94.678.971	48,97	2.036.783	49,07	1.550.555.745	52,99	2.151
I+II+III	**23.01.20-22.07.21**	**193.348.564**	**100,0**	**4.150.533**	**100,0**	**2.926.443.254**	**100,0**	**2.147**
I+II	23.01.20-22.01.21	98.669.014	51,03	2.113.733	50,93	1.375.887.509	47,01	2.142
III	23.01.21-22.07.21	94.678.971	48,97	2.036.783	49,07	1.550.555.745	52,99	2.151
I+II+III	**23.01.20-22.07.21**	**193.348.564**	**100,0**	**4.150.533**	**100,0**	**2.926.443.254**	**100,0**	**2.147**

3.2. Анализ трех фаз пандемии COVID-19 для каждой из 213 стран

Материалы и методы

С сайта Worldometer по каждой стране собраны четыре базы данных, датируемых 22.01.20, 22.07.20, 22.01.21 и 22.07.21. Количество случаев, смертей и тестов, относящихся к каждой фазе для каждой страны, было рассчитано путем вычитания данных предыдущей фазы из данных анализируемой фазы.

Например, в Малайзии на 22.01.20 было '0' смертей; на 22.07.20 было 123 смерти; на 22.01.21 уже умерло 660 человек, а к 22.07.21 умерло 7.574 человека. (рис. 10). Вычитая 0 из 123, 123 из 660, 660 из 7.574, получаем, что за 6 месяцев с 23.01.20 по 22.07.20 умерло 123 человека, с 23.07.20 по 22.01.21 – 537 человек, а с 23.01.21 по 22.07.21 умерло 6.914 человек. Для каждой страны значение CFR было рассчитано для каждой из трех фаз.

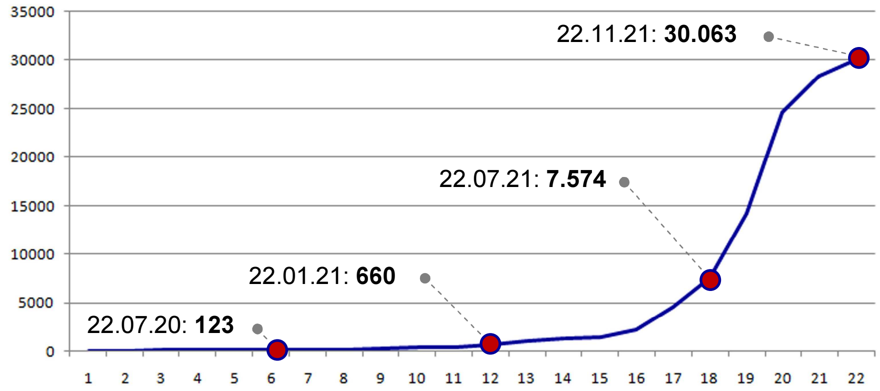

Рисунок 10. Динамика совокупного числа людей, умерших от COVID-19 в Малайзии.
По горизонтальной оси – номера месяцев, по вертикальной оси количество смертей.

Затем, для каждой страны было проведено сравнение количества случаев COVID-19, смертей и тестов, зарегистрированных в период 3-й фазы пандемии (23.01.21-22.07.21) по отношению к количеству аналогичных показателей, зарегистрированных за 1,5 года (23.01.20-22.07.21).

Например, в Монголии, на конец 2-й фазы (22.01.21), т.е. за первый год было всего 2 случая смерти; а на конец 3-й фазы (22.07.21), т.е. за 1,5 года пандемии, количество смертей увеличилось до 755. (рис. 11) Вычитая первую цифру из второй, получаем, что за 6 месяцев 3-й фазы пандемии в Монголии зарегистрировано 753 новых смертей от COVID-19. Если количество смертей за 3-ю фазу (n=753) разделить на количество смертей за 1,5 года пандемии (n=755), то получаем, что в течение 1,5 лет пандемии, 99,74% всех смертей от COVID-19 зарегистрировано во время 3-й фазы.

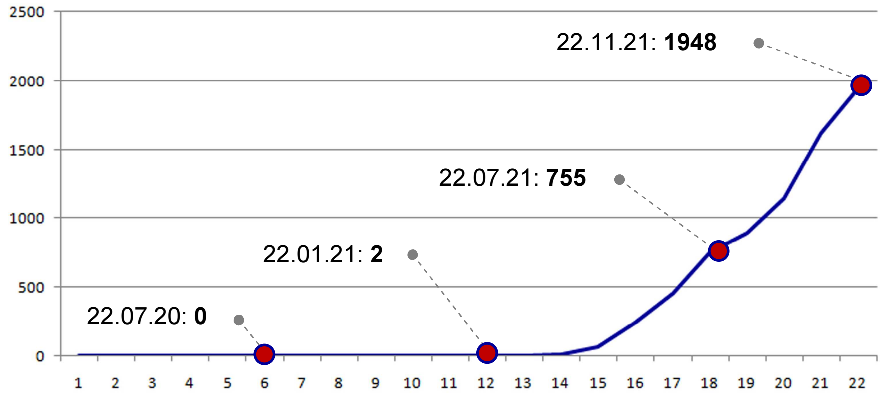

Рисунок 11. Динамика кумулятивного числа людей, умерших от COVID-19 в Монголии.
По горизонтальной оси – номера месяцев, по вертикальной оси количество смертей.

Результаты исследования

На основании значения CFR, рассчитанного для каждой фазы, 213 стран были разделены на 3 группы (Таблица 3/а). В группу стран, где CFR был менее 1,00%, вошли страны, где CFR был менее 0,50% и где CFR был нулевым. Средний коэффициент смертности для каждой фазы был рассчитан для стран (N), в которых были зарегистрированы смертельные случаи (Таблица 3/б).

Таблица 3. (а) Распределение стран группам с учетом CFR, и (б) среднее значение CFR по каждой фазе

(а)							(б)	
		CFR, %					**Среднее значение CFR** (%), среди стран, имевших случаи смерти	
Фазы	N	**> 2,0**	**1,0-2,0**	**< 1,0**	включая			
					< 0,50	0,00	Среднее значение CFR	число стран, N
I	213	110	39	64	41	28	3,597 ± 3,732	185
II	213	61	61	91	49	19	1,863 ± 2,616	194
III	213	68	72	73	37	16	2,025 ± 2,098	197

На основании сравнения цифр, относящихся к 3-й фазе и ко всему периоду в 1,5 года, все страны были разделены на 6 групп (Таблица 4). Если соотношение между параметрами пандемии, зарегистрированными в 3-й фазе, и аналогичными параметрами, зарегистрированными за 1,5 года пандемии, было выше 33,33 %, то это означает, что количество случаев COVID-19, смертей или тестов, зарегистрированных во время 3-й фазы, было выше среднего значения этого параметра, рассчитанного для каждой из трех фаз. Если это соотношение было выше 50,00 %, то это означает, что подавляющее большинство случаев COVID-19, смертей или тестов произошло во время 3-й фазы пандемии. Чем выше процент, тем больше случаев, смертей или тестов произошло во время 3-й фазы.

Таблица 4. Распределение стран по группам, в которых более одной трети случаев, смертей или тестов произошло в течение 3-й фазы пандемии COVID-19.

	Группы стран, выделенные по соотношению между параметрами пандемии, зарегистрированными в течение 3-й фазы, и аналогичными параметрами, зарегистрированными в течение 1,5 лет COVID-19 пандемии.						Общее количество стран, где соотношение было выше 33,33%
	33,33-50 %	**50-60 %**	**60-70 %**	**70-80 %**	**80-90 %**	**90-100 %**	
Случаи	71	43	29	15	8	14	**180** (84,51 %)
Смерти	50	43	19	14	14	17	**157** (73,71 %)
Тесты	52	67	34	19	9	12	**193** (90,61 %)

Выводы

Расчеты, проведенные в этом разделе, показали, что в большинстве стран наибольшее число случаев COVID-19, смертей и тестов было зафиксировано во время 3-й фазы пандемии.

Ниже мелким шрифтом представлен список стран, в которых подавляющее большинство (80-100%) случаев или смертей от COVID-19, или тестов произошло во время 3-й фазы пандемии.

Случаи COVID-19 [80-90%, n=8]: Ангилья, Антигуа и Барбуда, Маврикий, Малайзия, Мальдивы, Мэн (остров), Сент-Люсия и Шри-Ланка; [90–100%, n = 14]: Британские Виргинские острова, Вьетнам, Камбоджа, Куба, Лаос, Монголия, Папуа-Новая Гвинея, Сейшельские острова, Сент-Китс и Невис, Таиланд, Тайвань, Тимор-Лешти, Уругвай, и Фиджи,

Случаи смерти [80-90 %, n=14]: Антигуа и Барбуда, Барбадос, Гренадины, Замбия, Карибские Нидерланды, Кюрасао, Намибия, Парагвай, Реюньон, Сент-Винсент, Сент-Люсия, Сомали, Тринидад и Тобаго, Уганда, Эритрея; [90-100 %, n=17]: Ботсвана, Британские Виргинские острова, Вьетнам, Камбоджа, Куба, Лаос, Малайзия, Монголия, Папуа-Новая Гвинея, Сент-Китс и Невис; Сейшельские острова, Таиланд, Тайвань, Тимор-Лешти, Уругвай, Фиджи, и Шри-Ланка.

Тесты на SARS-CoV-2 [80-90 %, n=9]: Британские Виргинские острова, Вьетнам, Дания, Йемен, Кипр, Теркс и Кайкос, Таиланд, Тимор-Лешти, Чехия; [90-100 %, n=12]: Австрия, Алжир, Буркина, ДРК, Камерун, Фасо, Фиджи, Сирия, Сомали, Судан, Сьерра-Леоне, Тайвань, и Чад.

4. Двадцать два месяца пандемии COVID-19: динамика случаев, смертей, тестов и коэффициента смертности

Цель исследования

Оценить динамику ежемесячных параметров пандемии COVID-19 и выявить страны с наиболее выраженной негативной тенденцией.

4.1. Двадцать два месяца пандемии COVID-19: общее число случаев, смертей, тестов и коэффициента смертности во всем мире

Цель исследования

Оценить динамику ежемесячных показателей заболеваемости, смертей, тестов и коэффициента смертности во всем мире за 22 месяца пандемии COVID-19.

Материалы и методы

На сайте Worldometer, для каждой из 213 стран, было собрано 23 набора баз данных, датированных 22 числом каждого месяц, с января 2020 г. по ноябрь 2021 г. Базы данных, относящиеся к каждому месяцу для каждой страны, были рассчитаны путем вычитания данных за предыдущий месяц из данных анализируемого месяца.

Для каждой страны было подсчитано число ежемесячных случаев, смертей, тестов, CFR, а также соотношения между числом случаев и тестов (Сл/Т), числом смертей и тестов (См/Т), число случаев на 1 миллион (Сл/М) и число смертей на 1 миллион (См/М). Суммарные значения этих параметров для 213 стран подсчитаны и представлены в таблице 5. Ежемесячное количество случаев COVID-19, смертей и тестов, проиллюстрировано на рисунках 12-14.

Результаты исследования

В течение 22 месяцев пандемии, ежемесячное число случаев варьировало от 77.422, в первый месяц, до 21.729.103 – в 16-й месяц; имеется три пика, в 11-12-м, 15-16-м и 19-20-м месяцах (рис. 12). Ежемесячное число смертей варьировало от 2440 в первый месяц до 428.155 в 17-й месяц; есть два пика, в 12-м месяце и в 17-м месяце (рис. 13). Ежемесячное число тестов увеличивалось постепенно с 23.282.447 в 3-м месяце до 380.323.725 в 20-м месяце (рис. 14).

Таблица 5. Ежемесячное число случаев COVID-19, смертей, тестов и CFR, а также соотношения между числами случаев и тестов (Сл/Т), количеством смертей и тестов (См/Т).

М,№	Даты	Случаи	Смерти	Тесты	CFR, %	Сл/Т,%	См/Т,%	Сл/М	См/М
0	до 22.01.20	579	17	-	2.936	-	-	-	-
1	23.01.20 - 22.02.20	77.422	2.440	-	3.152	-	-	-	-
2	23.02.20 - 22.03.20	256.885	12.146	-	4.728	-	-	-	-
3	23.03.20 - 22.04.20	2.297.673	169.276	23.282.447	7.367	9.869	0.727	-	-
4	23.04.20 - 22.05.20	2.664.254	155.495	44.391.233	5.836	6.002	0.350	344	20
5	23.05.20 - 22.06.20	3.879.188	134.032	63.136.698	3.455	6.144	0.212	500	17
6	23.06.20 - 22.07.20	6.186.744	151.989	171.564.166	2.457	3.606	0.089	797	20
7	23.07.20 - 22.08.20	7.995.415	182.270	107.399.739	2.280	7.445	0.170	1.029	23
8	23.08.20 - 22.09.20	8.392.192	166.385	199.993.233	1.983	4.196	0.083	1.079	21
9	23.09.20 - 22.10.20	10.208.746	168.007	149.682.016	1.646	6.820	0.112	1.312	22
10	23.10.20 - 22.11.20	16.987.950	250.906	195.846.982	1.477	8.674	0.128	2.181	32
11	23.11.20 - 22.12.20	19.333.794	328.839	209.035.776	1.701	9.249	0.157	2.481	42
12	23.12.20 - 22.01.21	20.388.751	391.948	211.555.219	1.922	9.638	0.185	2.614	50
13	23.01.21 - 22.02.21	13.569.785	370.676	213.529.397	2.732	6.355	0.174	1.738	47
14	23.02.21 - 22.03.21	12.026.578	250.262	215.897.738	2.081	5.571	0.116	1.539	32
15	23.03.21 - 22.04.21	21.032.036	349.214	282.659.828	1.660	7.441	0.124	2.690	45
16	23.04.21 - 22.05.21	21.729.103	384.092	290.300.012	1.768	7.485	0.132	2.777	49
17	23.05.21 - 22.06.21	12.844.311	428.155	282.525.550	3.333	4.546	0.152	1.640	55
18	23.06.21 - 22.07.21	13.477.158	254.384	265.643.220	1.888	5.073	0.096	1.720	32
19	23.07.21 - 22.08.21	19.204.383	293.313	291.627.554	1.527	6.585	0.101	2.448	37
20	23.08.21 - 22.09.21	18.271.358	287.615	380.323.725	1.574	4.804	0.076	2.328	37
21	23.09.21 - 22.10.21	12.851.934	220.802	290.724.128	1.718	4.421	0.076	1.636	28
22	23.10.21 - 22.11.21	14.586.015	220.598	323.461.722	1.512	4.509	0.068	1.855	28

Самое высокое значение CFR (7,367%) и наибольшее значение соотношения случаев и тестов (9,869%), а также смертей и тестов (0,727%) были выявлены в 3-м месяце пандемии (23.03.20-22.04.20).

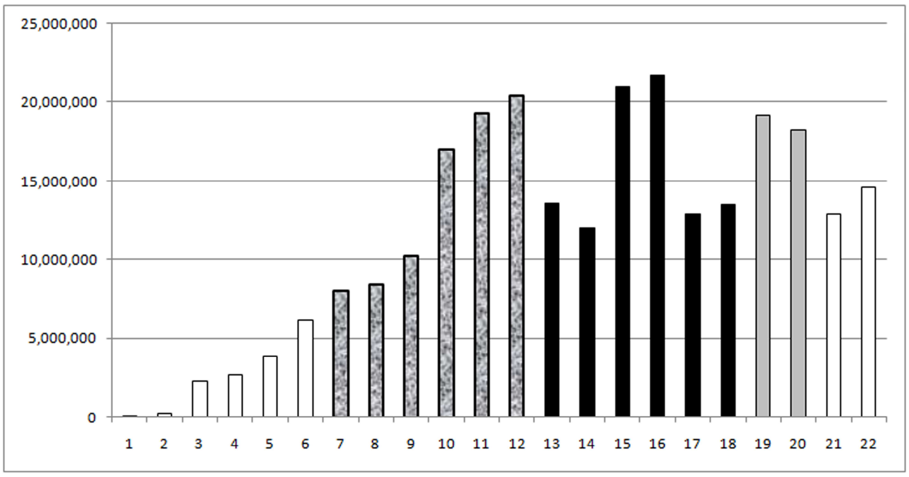

Рисунок 12. Ежемесячное число случаев COVID-19.
По горизонтальной оси – номера месяцев, по вертикальной оси – количество случев.
1-я фаза включает месяцы № 1-6 (белые столбцы); 2-я фаза включает месяцы № 7-12 (серо-белые столбцы); 3-я фаза включает месяцы № 13-18 (черные столбцы); месяцы № 19-20 (серые столбцы); месяцы № 21-22 (белые столбцы).

С 11 марта 2020 года, самое высокое значение недельного CFR (8,507%) было выявлено с 12 по 18 апреля 2020 года, а самое высокое значение дневного CFR (9,514%) было выявлено 17 апреля 2020 года.[1]

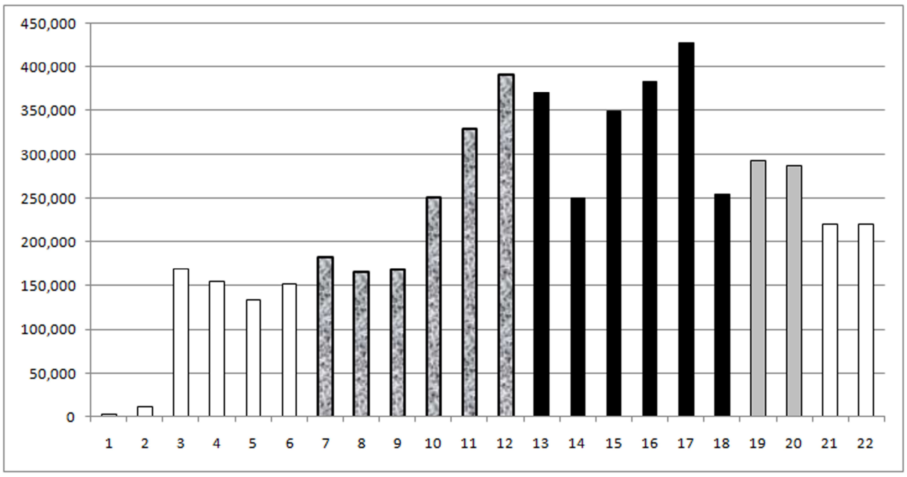

Рисунок 13. Ежемесячное число смертей, связанных с COVID-19.
По горизонтальной оси – номера месяцев, по вертикальной оси – количество смертей.
1-я фаза включает месяцы № 1-6 (белые столбцы); 2-я фаза включает месяцы № 7-12 (серо-белые столбцы); 3-я фаза включает месяцы № 13-18 (черные столбцы); месяцы № 19-20 (серые столбцы); месяцы № 21-22 (белые столбцы).

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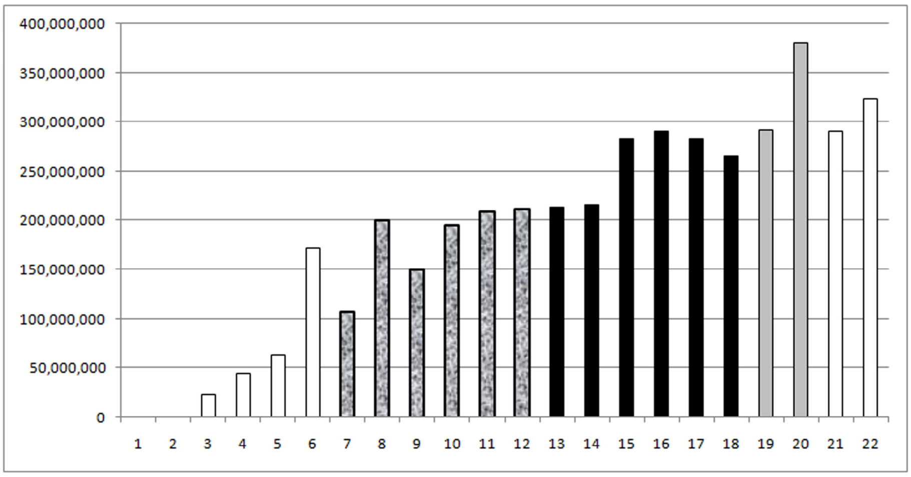

Рисунок 14. Ежемесячное число тестов, проводимых для выявления зараженных SARS-CoV-2.
По горизонтальной оси – номера месяцев, по вертикальной оси – количество тестов.
1-я фаза включает месяцы № 1-6 (белые столбцы); 2-я фаза включает месяцы № 7-12 (серо-белые столбцы); 3-я фаза включает месяцы № 13-18 (черные столбцы); месяцы № 19-20 (серые столбцы); месяцы № 21-22 (белые столбцы).

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4.2. Эволюция пандемии COVID-19, до и после окончания 3-й фазы

За 1,5 года пандемии, в большинстве проанализированных стран, наибольшее число случаев, смертей и тестов было зарегистрировано во время 3-й фазы.

Цель исследования

Изучить эволюцию пандемии COVID-19, до, и после окончания 3-й фазы.

Материалы и методы

На сайте Worldometer, по каждой из 213 стран, были собраны по три базы данных, датируемых 22.05.21, 22.07.21 и 22.09.21. Затем для каждой страны были подсчитаны число случаев COVID-19, число смертей и тестов, зарегистрированных в течение 2-х периодов времени: (1-й) 23.05.21-22.07.21 и (2-й) 23.07.21-22.09.21.

Прогрессивная или регрессивная тенденция пандемии была рассчитана путем деления числа случаев, смертей или тестов, зарегистрированных в течение 2-го периода времени, на число случаев, смертей или тестов, зарегистрированных в течение 1-го периода времени, соответственно. Если коэффициент был больше 1, т.е. больше 100 %, то это означает, что после окончания 3-й фазы, в анализируемой стране сохраняется тенденция роста числа случаев COVID-19, смертей или тестов.

Например, в Соединенном Королевстве на 22.05.21 было 127.716 смертей, на 22.07.21 – 128.980 смертей, и на 22.09.21 – 135.621 смертей. (рис. 15) Простой расчет показывает, что за 1-й анализируемый период (23.05.21-22.07.21) было зарегистрировано 1.264 новых случаев смерти, а за 2-й период (23.07.21-22.09.21) было зарегистрировано 6.641 новый случай смерти. Разделив 6.641 на 1.264, мы получим 5,225. Это означает, что количество смертей, зарегистрированных во втором периоде, более чем в пять раз превышало количество смертей, зарегистрированных в 1-м периоде. Таким образом, после завершения 3-й фазы, в Соединенном Королевстве по-прежнему наблюдалась тенденция к росту числа новых смертей, вызванных COVID-19.

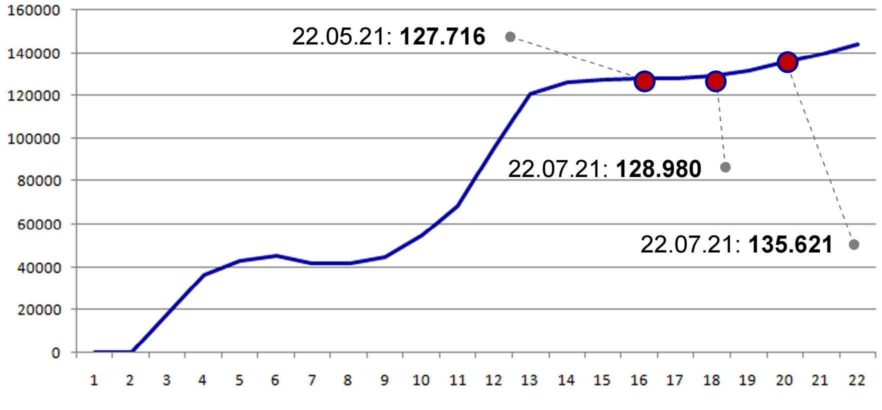

Рисунок 15. Динамика суммарного числа людей, умерших в Соединенном Королевстве. По горизонтальной оси – номера месяцев, по вертикальной оси количество тестов.

Результаты исследования

Сравнение основных параметров пандемии между 2-м и 1-м периодом времени для каждой страны показало, что в большинстве из них наблюдается тенденция роста числа новых случаев (n=158; 74,178%), числа смертей (n=133; 62,441%) и числа проводимых тестов (n=125; 58,685%). Таблица 6.

Таблица 6. Результаты сравнения числа случаев, смертей и тестов, зарегистрированных в базе данных 213 стран за 1-й (23.05.21-22.07.21) и 2-й (23.07.21-22.09.21) периоды времени.

#	**Снижение / Повышение**	**Новые Случаи**		**Новые Смерти**		**Проведенные Тесты**	
		N	%	N	%	N	%
1	Снижение (< 100%)	53	24,88	65	30,52	69	32,39
2	Без изменений	2	0,94	15	7,04	19	8,92
3	Повышение (> 100%)	158	74,18	133	62,44	125	58,69
	включая:						
	от 0 до 1+n	4	01,88	16	07,51	3	01,41
	+ 100 – 200 %	46	21,60	38	17,84	91	42,72
	+ 200 – 500 %	54	25,35	46	21,60	24	11,27
	+ > 500 %	54	25,35	33	15,49	7	03,29
	Всего	**213**	**100**	**213**	**100**	**213**	**100**

Выводы

В результате проведенных расчетов выявлены группы стран, в которых, после завершения 3-й фазы пандемии, по-прежнему наблюдался стремительный рост числа новых случаев COVID-19, смертей и проведенных тестов на SARS-CoV-2.

В некоторых странах, значения анализируемых параметров увеличились в 5-10 и более раз. В Гваделупе, Израиле и Вьетнаме произошло многократное увеличение всех параметров пандемии, включая новые случаи, смерти и проведенные тесты.

Список стран с многократным увеличением числа случаев COVID-19, смертей и тестов в период с 23.07.21 по 22.09.21 представлен ниже мелким шрифтом:

Увеличение числа новых случаев [в 5-10 раз; n=29]: Австрия, Барбадос, Бурунди, Болгария, Вьетнам, Гвинея-Бисау, Гренландия, Йемен, Лаос, Маврикий, Марокко, Мартиника, Молдова, Нигерия, Новая Зеландия, Палестина, Сан-Томе и Принсипи, Сент-Люсия, Сингапур, Сомали, США, Теркс и Кайкос, Того, Экваториальная Гвинея, Эсватини, Эстония, Эфиопия, Ямайка, и Япония; [в 10-20 раз; n=8]: Азербайджан, Аруба, Босния и Герцеговина, Исландия, Монтсеррат, Румыния, Сербия, Черногория,; [более чем в 20 раз; n=16]: Австралия, Албания, Ангилья, Антигуа и Барбуда, Бенин, Бермуды, Бруней, Гваделупа, Гренада, Доминика, Израиль, Новая Каледония, Сан-Марино, Северная Македония, Французская Полинезия, и ЦАР.

Увеличение числа смертей [в 5-10 раз; n=17] Азербайджан, Белиз, Бенин, Гамбия, Гана, Гвинея-Бисау, Казахстан, Кюрасао, Ливия, Нигерия, Северная Македония, Сент-Люсия, Сингапур, Соединенное Королевство, Тимор-Лешти, Того, и Эсватини; [в 10-20 раз; n=8] Албания, Барбадос, Бермуды, Бурунди, Израиль, Кот-д'Ивуар, Мальта, и Марокко; [более чем в 20 раз; n=8] Австралия, Аруба, Вьетнам, Гваделупа, Маврикий, Мартиника, Сомали, и Французская Полинезия.

Увеличение числа проовежденных тестов [в 3-5 раз; n=5] Вьетнам, Гваделупа, Израиль, Фолклендские острова, и Южный Судан; [более чем в 5 раз; n=7] Бруней, Бутан, Доминика, Реюньон, Сен-Пьер Микелон, Таиланд, и Тимор-Лешти.

4.3. Изучение динамики параметров пандемии после завершения 3-й фазы

Цель исследования

Изучить динамику месячного количества новых случаев, смертей и тестов в каждой из 213 стран, за 19-22 месяцы пандемии COVID-19 и выявить страны, где наблюдается ухудшение эпидемической обстановки.

Материалы и методы

Среднемесячное количество случаев, смертей и тестов подсчитывалось за два периода времени после окончания 3-й фазы, а именно, 1-й период – месяцы № 19-20 (23.07.21-22.09.21), и 2-й период – месяцы № 21-22 (23.09.21-22.11.21). Затем производилось сравнение этих параметров путем деления чисел, относящихся к месяцам № 21-22, на числа, относящиеся к предыдущим двум месяцам № 19-20.

Если соотношение было больше 1, т.е. больше 100 %, то это означает, что в этой стране была тенденция, указывающая на рост случаев COVID-19, смертей или тестов. Если соотношение было меньше 1, т.е. менее 100%, то это означает, что параметры пандемии имели тенденцию к снижению. Результаты расчета представлены в таблице 7.

Результаты исследования

В большинстве стран, за последние два месяца (№ 21-22), подвергнутых анализу, выявлена тенденция к снижению основных параметров пандемии. Тем не менее, выявлена группа стран, в которых среднемесячное число новых случаев и смертей, за последние месяцы было как минимум в 5 раз выше, чем в предыдущие два месяца; а среднемесячное количество тестов в последние два месяцы было, как минимум, в 2 раза выше, чем в предыдущие два месяца.

Таблица 7. Результаты сравнения числа случаев, смертей и тестов, зарегистрированных в базе данных 213 стран, за 1-й (23.07.21-22.09.21) и 2-й (23.09.21-22.11.21) периоды времени.

#	**Снижение / Повышение**	**Новые Случаи**		**Новые Смерти**		**Проведенные Тесты**	
		N	%	N	%	N	%
1	Снижение (< 100%)	129	60,56	108	50,70	124	58,22
2	Без изменений	2	0,94	10	4,70	25	11,74
3	Повышение (> 100%)	82	38,50	95	44,60	64	30,04
	включая:						
	от 0 до 1+n	0	00,00	5	02,35	3	01,41
	+ 100 – 200 %	32	15,03	29	13,62	51	23,94
	+ 200 – 500 %	35	16,43	33	15,49	8	03,75
	+ > 500 %	15	07,04	28	13,14	2	00,94
	Всего	**213**	**100**	**213**	**100**	**213**	**100**

Выводы

Сравнение данных, относящихся к последним двум месяцам № 21-22, и к двум предыдущим месяцам № 19-20, выявило тенденцию, свидетельствующую о снижении числа случаев, смертей и тестов.

Тем не менее, выделилась группа стран, где основные параметры пандемии имели тенденцию к росту. В список стран с прогрессирующей тенденцией пандемии, представленный ниже мелким шрифтом, вошли только страны с общей численностью населения не менее 3 000 000 человек.

Увеличение числа новых случаев, более чем в 5 раз [n=11] Камерун (526%), Хорватия (536%), Румыния (713%), Украина (844%), Сингапур (973%), Папуа-Новая Гвинея (1033%), Словакия (1643%), Чехия (2037%), Венгрия (2066%), Польша (2537%), Танзания (2897%).

Увеличение числа смертей, более чем в 5 раз [n=19] Египет (504%), Австрия (546%), Молдова (565%), Хорватия (625%), Нигер (643%), Конго (987%), Камерун (1058%), Лаос (1064%), Украина (1115%), Румыния (1214%), Буркина-Фасо (1271%), Новая Зеландия (1300%), Папуа-Новая Гвинея (1370%), Чехия (1744%), Польша (1817%), Сингапур (1856%), Танзания (2334%), Словакия (2418%), Венгрия (2463%).

Увеличение числа проведенных тестов, более чем в 2 раза [n=8] Словения (213%), Израиль (219%), Греция (219%), Украина (226%), Венгрия (235%), Германия (256%), Бразилия (260%), Таиланд (533%).

4.4. Изучение динамики параметров пандемии за последние два месяца (№ 21-22).

Цель исследования

Изучить динамику месячного количества новых случаев COVID-19, смертей и проведенных тестов, в каждой из 213 стран, за последние два анализируемых месяца № 21-22, и выявить страны с негативной тенденцией.

Материалы и методы

Количество ежемесячных случаев, смертей и проведенных тестов за два месяца № 22 (23.10.21-22.11.21) и № 21 (23.09.21-22.10.21) было подсчитано по методике, описанной в предыдущих разделах. Сравнение двух месяцев проводилось путем деления числа основных параметров, относящегося к 22-му месяцу, на число, относящееся к 21-му месяцу.

Если соотношение больше 1, т.е. больше 100 %, то в анализируемой стране по-прежнему сохраняется тенденция роста числа случаев COVID-19, смертей или тестов. Если отношение меньше единицы (<100%), то это означает, что параметры пандемии имели тенденцию к снижению. Результаты представлены в таблице 8.

Результаты исследования

Сравнение данных, относящихся к месяцу № 22, с данными, относящимися к предыдущему месяцу № 21, выявило тенденцию к снижению числа новых случаев, смертей и тестов.

Тем не менее, по-прежнему есть группы стран, где число новых случаев и смертей в течение месяца № 22 было, как минимум, в 5 раз выше, чем в течение предыдущего месяца № 21; а количество тестов в течение месяца № 22 было как минимум в 2 раза выше, чем в течение предыдущего месяца № 21.

Таблица 8. Результаты сравнения числа случаев, смертей и тестов, зарегистрированных в базе данных 213 стран, за 21-й (23.09.21-22.10.21) и 22-й (23.10.21-22.11.21) месяцы.

#	**Снижение / Повышение**	**Новые Случаи**		**Новые Смерти**		**Проведенные Тесты**	
		N	%	N	%	N	%
1	Снижение (< 100%)	118	55,40	117	54,93	96	45,07
2	Без изменений	6	2,82	16	7,51	40	18,78
3	Повышение (> 100%)	89	41,78	80	37,56	77	36,15
	включая:						
	от 0 до 1+n	0	00	10	04,69	9	04,23
	+ 100 – 200 %	48	22,53	49	23,01	57	26,76
	+ 200 – 500 %	35	16,43	16	07,51	10	04,69
	+ > 500 %	6	02,82	5	02,35	1	00,47
	Всего	**213**	**100**	**213**	**100**	**213**	**100**

В список стран с прогрессирующей тенденцией пандемии, представленный ниже мелким шрифтом, вошли только страны с общей численностью населения не менее 3.000.000 человек.

Увеличение числа случаев, более чем в 5 раз [n=3]: Польша (638%), Чехия (803%), Венгрия (733%).

Увеличение числа смертей, более чем в 5 раз [n=5]: Польша (535%), Венгрия (768%), Нигер (800%), Чехия (1075%), Новая Зеландия (1200%).

Увеличение числа проведенных тестов, более чем в 2 раза [n=7]: Нигерия (204%), Иран (211%), Венгрия (220%), Гаити (250%), Аргентина (236%), Германия (290%), Дания (308%).

Выводы

Исследование, проведенное в данном разделе, показало, что в течение 21-22 месяцев в большинстве анализируемых стран количество новых случаев COVID-19, смертей и тестов имело тенденцию к снижению. Можно предположить, что положительная динамика параметров пандемии является объективной основой для оптимизма и вселяет надежду на скорое окончание пандемии.

5. Обсуждение

Анализ основных эпидемиологических показателей позволил выделить три фазы пандемии. Эти фазы различаются по количеству новых тестов, случаев и смертей, и имеют свои особенности в каждой стране.

Первая фаза (23.01.20-22.07.20) началась с выявления новых случаев и первых жертв COVID-19 за пределами Китая. Во время первой фазы диагностические тесты, для выявления заражения вирусом SARS-CoV-2, использовались, в основном, среди людей с симптомами и среди тех, кто контактировал с больными. Клинические испытания потенциально эффективных препаратов находились в начальной фазе, и активно применялась инвазивная искусственная вентиляция легких, которая не имеет лечебного эффекта среди пациентов с COVID-19.

Поскольку протоколы лечения еще не были разработаны, а число подтвержденных случаев было небольшим, значение коэффициента смертности (CFR) было самым высоким за всю историю пандемии.

Во второй фазе (23.07.20-22.01.21) клинические испытания были завершены, и врачи получили эффективные протоколы лечения. Несмотря на появление новых вариантов вируса, механизмы развития заболевания остались неизменными и не могли быть причиной для более тяжелого течения заболевания.[118-119] В большинстве стран уровень смертности был не высоким, и к концу второй фазы мировая статистика указывала на скорое завершение пандемии.[1]

В третьей фазе пандемии (23.01.21-22.07.21), во многих странах, для защиты населения от SARS-CoV-2, была начата массовая вакцинация. В это же время произошел внезапный рост числа новых случаев и смертей, для которого трудно найти рациональное объяснение. Самое большое число новых смертей было зафиксировано в период с 23 мая по 22 июня 2021 г. Наиболее резкое изменение эпидемиологической кривой произошло в странах, где врачи успешно боролись с COVID-19 в течение первого года пандемии [см. приложение: Камбоджа, Куба, Лаос, Малайзия, Монголия, Сейшелы, Сингапур, Шри-Ланка, Тайвань, Танзания, Таиланд, Уругвай, Вьетнам и др.].

В группу стран, где за время 3-й фазы было зарегистрировано более 90% смертей, вошли Ботсвана, Британские Виргинские острова, Вьетнам, Камбоджа, Куба, Лаос, Малайзия, Монголия, Фиджи, Папуа-Новая Гвинея, Сент-Китс и Невис, Сейшельские острова, Шри-Ланка, Тайвань, Таиланд, Тимор-Лешти, и Уругвай.

Дальнейшее развитие пандемии было волнообразным продолжением третьей фазы.

После окончания 3-й фазы в течение следующих двух месяцев (№ 19-20) в большинстве анализируемых стран число смертей продолжало увеличиваться.

Однако в течение двух последних анализируемых месяцев (№ 21-22) количество новых случаев COVID-19, смертей и тестов имело тенденцию к снижению, что является объективной предпосылкой к скорому окончанию пандемии.

6. Выводы

Прошло два года с тех пор, как муниципальная комиссия здравоохранения г. Ухань объявила об эпидемии неизвестной пневмонии. Несмотря на положительную динамику в течение октября-ноября 2021 года, текущая пандемия еще не закончилась, и необходимы дополнительные исследования для выявления причин роста числа новых случаев и летальных исходов, наблюдаемых в течение третьей фазы пандемии.

6.1. После моделирования прогноза, сделанного Нилом М. Фергюсоном и его командой (Имперский колледж Лондона) в марте 2020 года,[120] многие страны ввели социальное дистанцирование, карантин и комендантский час. Несмотря на возражения против расчетов г-на Фергюсона со стороны его собственных коллег,[121] а также изъятие COVID-19 из категории инфекционных заболеваний с тяжелыми последствиями, что произошло в Объединенном Королевстве,[122] тем не менее, в большинстве стран карантинные меры были продолжены. Что касается медицинской профилактической меры, в виде программы глобальной вакцинации, то она была предложена еще до того, как новое заболевание получило свое название.[115,123]

К настоящему времени проведено огромное количество исследований, согласно которым, профилактические меры, в определенных случаях могут оказывать негативное воздействие на организм человека. Это относится к неадекватным действиям руководства стран и регионов в целом,[124-127] карантину и локдауну,[128-138] ношению масок,[139-153] и проводимой вакцинации.[154-225] В ряде случаев, эти меры имели низкую эффективность, и были бесполезными с точки зрения профилактики инфекционных заболеваний.[226-253] Количество исследований, демонстрирующих неэффективность и вредность проводимых мероприятий, непрерывно возрастает.[253a,253b]

Поскольку основной мишенью для SARS-CoV-2 являются люди с ослабленным Т-клеточным иммунитетом,[13,40-42] а длительный психический стресс влияет на весь организм[124-126,254] и на иммунную систему, в частности,[255-259] поэтому необходимо провести дополнительное исследование, которое позволило бы ответить на вопрос: могут ли медицинские и немедицинские меры, используемые для предотвращения распространения SARS-CoV-2, ухудшить естественный иммунитет? Этот вопрос особенно актуален для стран, в которых наблюдался необъяснимый рост заболеваемости и смертности во время третьей фазы пандемии.

Утвердительный ответ на этот вопрос весьма вероятен, так как определенные виды лечебно-профилактических препаратов способны перепрограммировать реакцию иммунной системы,[163] а без новой дозы вакцины, специфический иммунитет организма снижается через 3-6 месяцев.[252] Более того, наметилась тенденция к увеличению числа случаев герпетической инфекции,[260-270] а связь между ослабленным иммунитетом и герпесом была признана более полувека назад.[271-272]

Поскольку в список критериев исключения из клинических испытаний вакцин против SARS-CoV-2 вошли лица, получавшие иммуномодулирующие препараты,[273] что, вероятно, вызвано их ускоренным иммунологическим ответом на вакцинацию,[274] а также лица, имеющие естественный специфический иммунитет после выздоровления от COVID-19,[275-284] то эти две группы людей должны быть проанализированы отдельно. Поэтому, необходимы, как минимум, четыре группы исследований, включая:

1) не привитые люди, не получавшие иммуномодулирующие препараты;
2) не привитые люди, получавшие иммуномодулирующие препараты;
3) не привитые люди, выздоровевшие от COVID-19 спонтанно или после лечения;
4) привитые люди, получившие одну, две, три и более доз вакцин.

6.2. В июле 2021 года было объявлено, что после 31 декабря 2021 года, CDC (Центр по контролю и профилактике заболеваний США) отзовет запрос к FDA (Управлению по контролю за продуктами и лекарствами США), на разрешение на использование ПЦР теста, в качестве диагностической процедуры, в условиях чрезвычайной ситуации, вызванной новой коронавирусной инфекцией.[285]

Ранее, ПЦР тест, как метод проведения скрининга, был отвергнут многими экспертами, что было вызвано его ненадежностью и низкой эффективностью.[286-289]

Отрицательное решение было ими принято во избежание эпидемических последствий ложноположительных результатов, которые могут быть вызваны загрязнением окружающей среды,[290-294] заражением тестовых наборов,[288,295-301] ограниченными возможностями самого диагностического метода,[302] программным обеспечением, используемым в диагностическом оборудовании,[303] а также, в связи с применением диагностического порога в 25-30 циклов и выше.[304-306]

Количество ложноположительных результатов может резко увеличиться, если ПЦР тест используется для проведения скрининга в больших объемах в зоне с низкой распространенностью SARS-CoV-2.[307-309] Таким образом, массовое тестирование с использованием ПЦР тестов может создать ложную эпидемию без реального на то основания. Подобные случаи уже были описаны в истории эпидемий.[310]

Когда д-р Тедрос А. Гебрейесус предположил о начале пандемии (11.03.20),[48] объективных данных для такого заключения у представителей ВОЗ еще не было. Пять дней спустя Директор ВОЗ объяснил, что не знает, сколько людей было инфицировано, и предложил всем странам заполнить этот информационный пробел. В частности, д-р Т. А. Гебрейесус, сказал: "У нас есть простое послание для всех стран: тестируйте, тестируйте, и еще раз – тестируйте".[311] Массовое тестирование привело к внезапным вспышкам эпидемий COVID-19, произошедших во многих странах, и этот факт нельзя объяснить рационально, исходя из естественной эволюции инфекционных заболеваний.[312]

Поскольку недавние исследования *S. Shah, A. Stang и соавт.* (2021) показали, что применение массового скрининга с помощью ПЦР теста не позволяет прогнозировать тяжелые случаи и летальные исходы,[289,313] поэтому требуется дополнительное исследование, чтобы ответить на вопрос: может ли массовая диагностика, проводимая с помощью ПЦР теста, увеличить количество смертей, особенно в тех странах, где карантинные учреждения не имеют специализированных боксов для каждого человека, поступившего с подозрением на новую инфекцию.[314-316]

6.3. Можно предположить, что использование неспециализированных помещений для карантина и лечения пациентов с инфекционными заболеваниями должно привести к негативным последствиям. Например, преобразование новой многопрофильной городской больницы № 40 г. Москвы в специализированный стационар для больных COVID-19, без проведения реконструкции в соответствии с гигиеническими требованиями к инфекционным медицинским учреждениям, привело к неуклонному росту больничной смертности. (рис. 16) Три четверти больных умерло от сепсиса, вызванного K. *Pneumoniae*, A. *Baumannii*, P. *Aeruginosa*, E. *Coli*, S. *Aureus*, грибками и прочими устойчивыми возбудителями.[317]

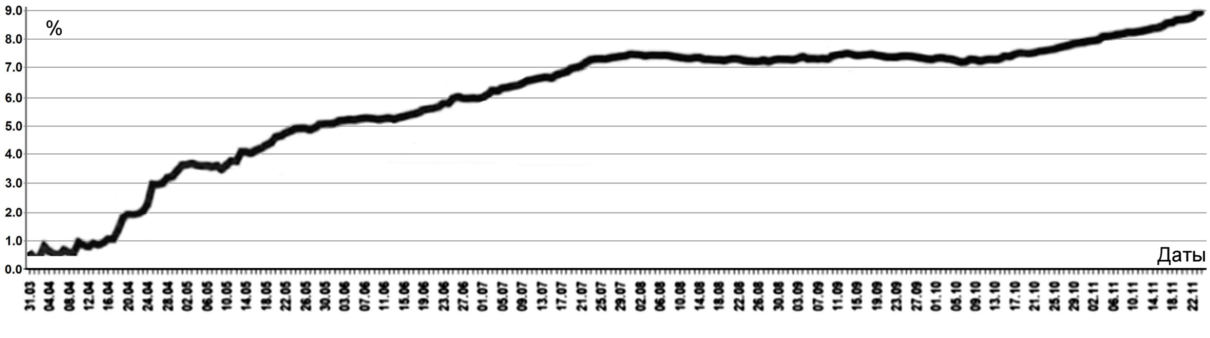

Рисунок 15. Устойчивый рост смертности в больнице № 40 г. Москва.
Модифицированный скриншот доклада "COVID-19 и сепсис" (1.55-2.35 мин).[317]
По горизонтальной оси – даты: с 31.03.20 по 22.11.20; по вертикальной оси – больничная смертность.

Поскольку эти данные были представлены главным врачом современной и хорошо оборудованной больницы, то можно предположить, что массовая смертность от внутрибольничной инфекции была обычным явлением для аналогичных больниц по всему миру.[318-322] Поэтому необходимо тщательное расследование причин смерти, чтобы различать смерти от COVID-19 и смерти от других причин. Вероятно, будет обнаружено много статистических ошибок, вызванных несовершенной диагностикой и регистрацией умерших.[250,323-325]

6.4. Необходимо провести сравнение различных терапевтических методов и протоколов, используемых во время текущей пандемии, для выявления наиболее эффективных.[65,82,85,86,326-329] Не менее важной задачей является анализ информации о профилактическом эффекте некоторых лекарств, пищевых добавок, витаминов и микроэлементов.[330-347] Этот анализ должен проводиться экспертами в соответствующей области, которые уже продемонстрировали свои знания и низкую смертность среди COVID-19 пациентов, а не сторонним рецензентом, не имеющим практического опыта работы с анализируемыми препаратами, который отбирает и отбрасывает научные публикации с непрофессиональным взглядом на рассматриваемое средство или метод. В противном случае мы получим отрицательные результаты, о которых нас предупреждали Илья Пригожин и др., (1984): "*то, что в течение многих поколений было источником радости и наслаждения, увядает от прикосновения науки*".[348] Глобальные негативные последствия непрофессионального анализа получили широкую огласку после того, как группа рецензентов "не смогла подтвердить пользу" от использования гидроксихлорохина и хлорохина.[84]

Таким образом, только полная информация о положительном и отрицательном влиянии медицинских и немедицинских методов профилактики COVID-19 может помочь в организации эффективных мер по прекращению нынешней пандемии и по предотвращению ее повторения в будущем.

Предположительно, имеется несколько причин негативного развития текущей пандемии, включая непрофессиональное управление профилактическими и лечебными мероприятиями, чрезмерное доверие ПЦР-тестам, применение неспециализированных помещений для карантина и лечения, игнорирование профилактического лечения, неадекватное изменение терапевтических протоколов, и снижение индивидуального и коллективного и иммунитета.

Можно предположить, что использование иммуномодулирующих препаратов (экстракты тимуса, пептиды тимуса) у людей со сниженным Т-клеточным иммунитетом, а также переход от стандартных протоколов профилактики и лечения, к индивидуальным, смогли бы ускорить процесс завершения текущей пандемии.

Приложение включает иллюстрации для следующих стран: Австралия, Азербайджан, Беларуссия, Великобритания, Венгрия, Вьетнам, Германия, Дания, Зимбабве, Израиль, Индия, Индонезия, Испания, Италия, Казахстан, Камбоджия, Куба, Лаоса, Малайзия, Марокко, Монголия, Намибия, Норвегия, Парагвай, Польша, Россия, Сейшелы, Сингапур, США, Таиланд, Тайвань, Танзания, Украина, Уругвай, Финляндия, Чехия, Швеция, Шри-Ланка, Южная Корея, Япония.

Литература

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PS. Непрерыность некоторых веб-адресов была нарушена во время форматирования рукописи. При поиске источника восстановить прерванный адрес.

Если при попытке открыть веб-страницу появляется сообщение [403 access forbidden] (403, доступ запрещен), игнорируйте его, и щелкните по веб-адресу еще раз.

Приложение - Иллюстрации

Динамика числа умерших за 22 месяца пандемии в разных странах

Способ проведения сбора баз данных и расчетов по каждому месяцу, описаны в разделах 2 и 4. Совокупное и помесячное число случаев, смертей, тестов, CFR, IFR, Сл/М, См/М, и население стран были представлены в виде таблицы (см. пример для Австралии). Графические иллюстрации для различных стран включают (а) Динамику совокупного числа смертей за 22 месяца пандемии COVID-19; и (б) Ежемесячное число смертей от COVID-19 во время пандемии. Эти иллюстрации могут помочь врачам соответствующих стран понять свои ошибки, которые привели к увеличению числа новых случаев и смертей, и исправить их.

Австралия

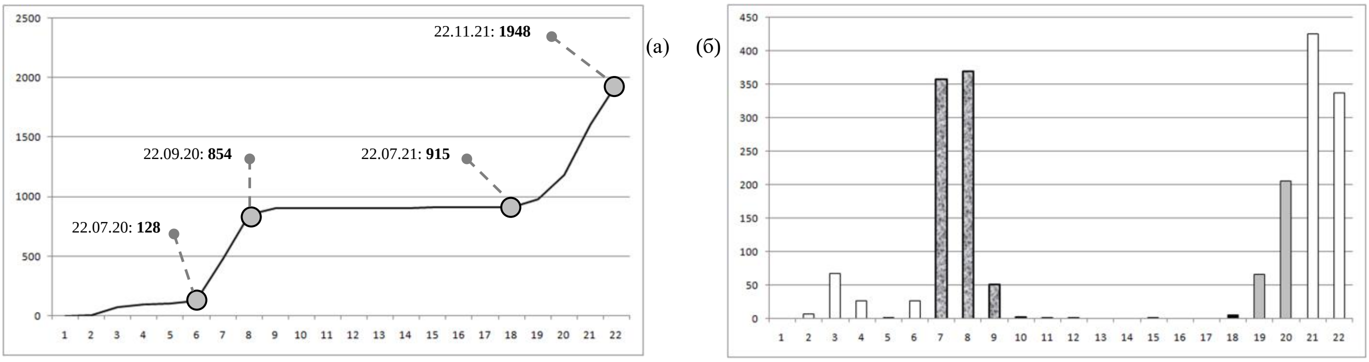
а) Совокупное число случаев, смертей, тестов, CFR, IFR, Сл/М, См/М

#	Date	Cases	Deaths	Tests	Population	CFR	IFR	C/M	D/M
0	22.01.20	-	-	-	-	-	-	-	-
1	22.02.20	21	0	0	0	0	-	-	-
2	22.03.20	1353	7	0	0	0.517	-	-	-
3	22.04.20	6649	74	452441	0	1.113	-	-	-
4	22.05.20	7095	101	1170682	25466640	1.424	0.036	278.60	3.97
5	22.06.20	7474	102	2105974	25491691	1.365	0.063	293.19	4.00
6	22.07.20	12894	128	3641780	25515934	0.993	0.079	505.33	5.02
7	22.08.20	24602	485	5646546	25540986	1.971	0.242	963.24	18.99
8	22.09.20	26942	854	7351283	25566037	3.170	0.506	1053.82	33.40
9	22.10.20	27466	905	8420326	25590280	3.295	0.602	1073.30	35.37
10	22.11.20	27821	907	9713327	25615331	3.260	0.687	1086.11	35.41
11	22.12.20	28219	908	10720719	25639574	3.218	0.747	1100.60	35.41
12	22.01.21	28755	909	12642312	25664626	3.161	0.865	1120.41	35.42
13	22.02.21	28930	909	14089305	25689677	3.142	0.957	1126.13	35.38
14	22.03.21	29205	909	15209275	25712304	3.112	1.023	1135.84	35.35
15	22.04.21	29588	910	16481110	25737355	3.076	1.094	1149.61	35.36
16	22.05.21	30003	910	17797116	25762406	3.033	1.164	1164.60	35.32
17	22.06.21	30366	910	19821498	25786649	2.997	1.280	1177.59	35.29
18	22.07.21	32426	915	23457810	25810892	2.822	1.425	1256.29	35.45
19	22.08.21	44034	981	29437845	25836752	2.228	1.410	1704.32	37.97
20	22.09.21	90391	1186	36219104	25860995	1.312	1.021	3495.26	45.86
21	22.10.21	154489	1611	41907968	25885238	1.043	0.938	5968.23	62.24
22	22.11.21	199659	1948	46696043	25910289	0.976	0.977	7705.78	75.18

б) Месячное число случаев, смертей,тестов, CFR, Сл/М См/М

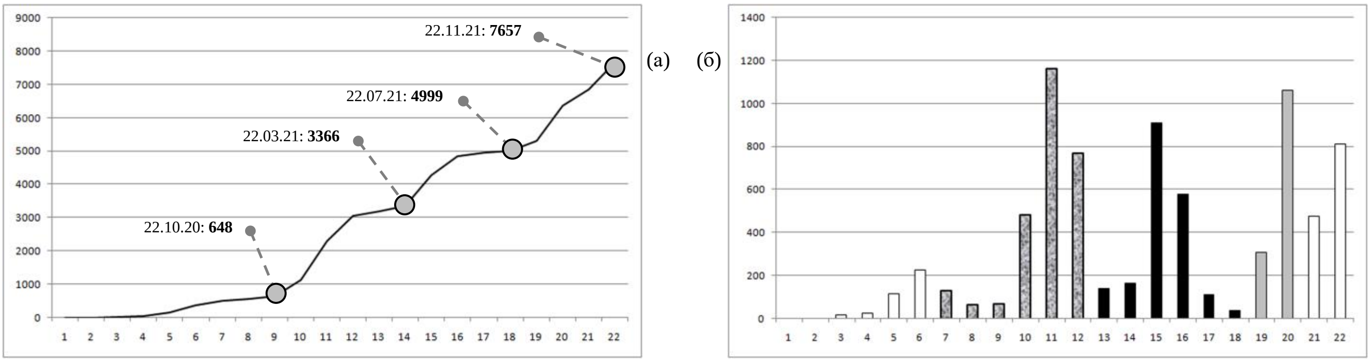
#	Date	Cases	Deaths	Tests	CFR	C/M	D/M
0	before 22.01.20	0	0	0	0	0	0
1	23.01.20 - 22.02.20	21	0	0	0	-	0
2	23.02.20 - 22.03.20	1332	7	0	0.526	-	-
3	23.03.20 - 22.04.20	5296	67	452441	1.265	-	-
4	23.04.20 - 22.05.20	446	27	718241	6.054	17.51	1.06
5	23.05.20 - 22.06.20	379	1	935292	0.264	14.87	0.04
6	23.06.20 - 22.07.20	5420	26	1535806	0.480	212.42	1.02
7	23.07.20 - 22.08.20	11708	357	2004766	3.049	458.40	14.00
8	23.08.20 - 22.09.20	2340	369	1704737	15.769	91.53	14.43
9	23.09.20 - 22.10.20	524	51	1069043	9.733	20.48	2.00
10	23.10.20 - 22.11.20	355	2	1293001	0.563	13.86	0.08
11	23.11.20 - 22.12.20	398	1	1007392	0.251	15.52	0.04
12	23.12.20 - 22.01.21	536	1	1921593	0.187	20.88	0.04
13	23.01.21 - 22.02.21	175	0	1446993	0	6.81	0.00
14	23.02.21 - 22.03.21	275	0	1119970	0	10.70	0.00
15	23.03.21 - 22.04.21	383	1	1271835	0.261	14.88	0.04
16	23.04.21 - 22.05.21	415	0	1316006	0	16.11	0.00
17	23.05.21 - 22.06.21	363	0	2024382	0	14.08	0.00
18	23.06.21 - 22.07.21	2060	5	3636312	0.243	79.81	0.19
19	23.07.21 - 22.08.21	11608	66	5980035	0.569	449.28	2.55
20	23.08.21 - 22.09.21	46357	205	6781259	0.442	1792.55	7.93
21	23.09.21 - 22.10.21	64098	425	5688864	0.663	2476.24	16.42
22	23.10.21 - 22.11.21	45170	337	4788075	0.746	1743.32	13.01

Австралия



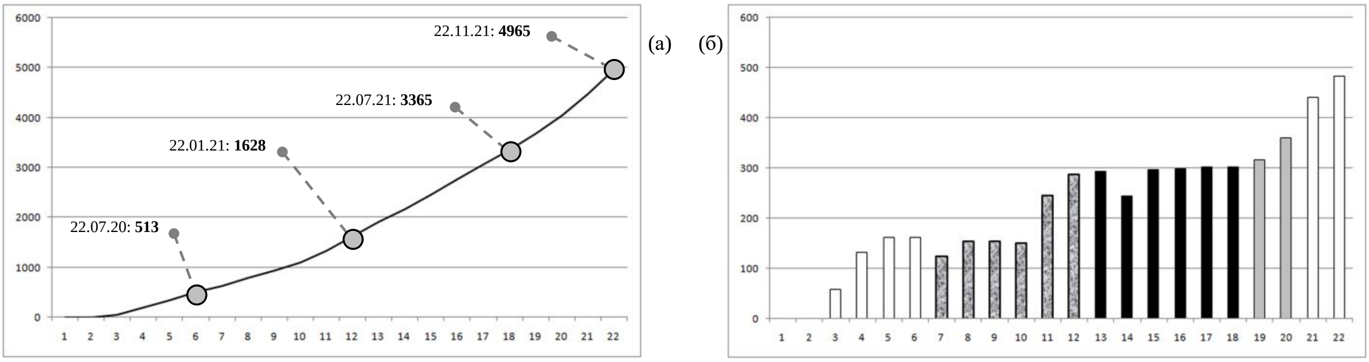
а) Динамика совокупного числа людей, умерших от COVID-19 в Австралии.
б) Ежемесячное число смертей, связанных с COVID-19 в Австралии.
По горизонтальной оси – номера месяцев, по вертикальной оси – количество смертей.
1-я фаза включает месяцы № 1-6 (белые столбцы); 2-я фаза включает месяцы
№ 7-12 (серо-белые столбцы); 3-я фаза включает месяцы № 13-18 (черные столбцы);
месяцы № 19-20 (серые столбцы); месяцы № 21-22 (белые столбцы).

Азербайджан



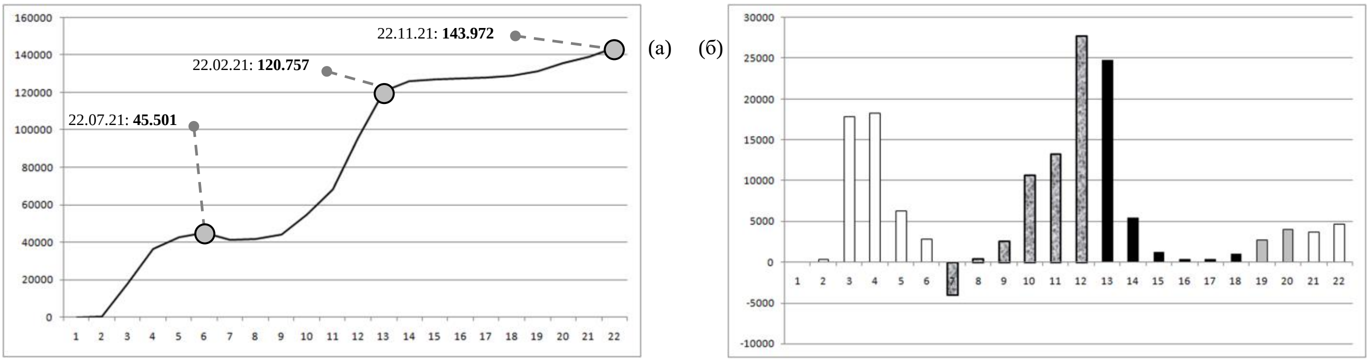
а) Динамика совокупного числа людей, умерших от COVID-19 в Азербайджане.
б) Ежемесячное число смертей, связанных с COVID-19 в Азербайджане.

Белоруссия



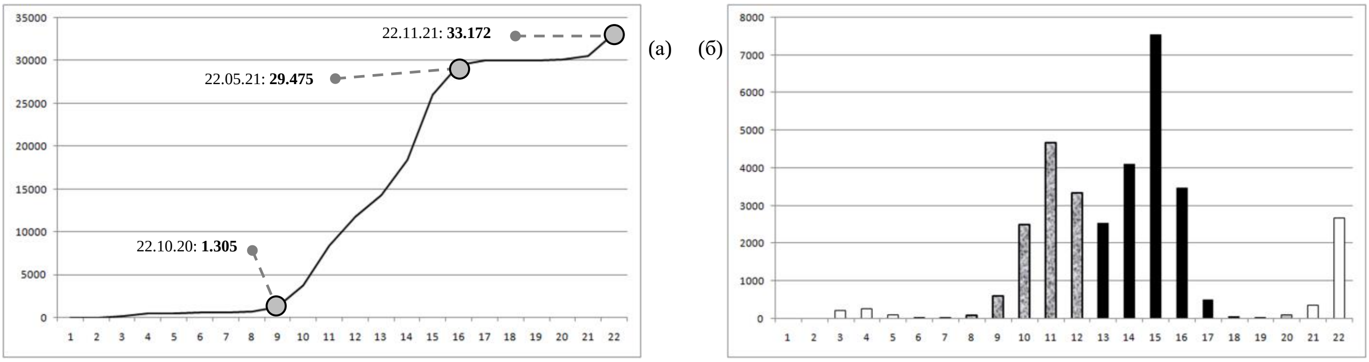
а) Динамика совокупного числа людей, умерших от COVID-19 в Белоруссии.
б) Ежемесячное число смертей, связанных с COVID-19 в Белоруссии.

Великобритания



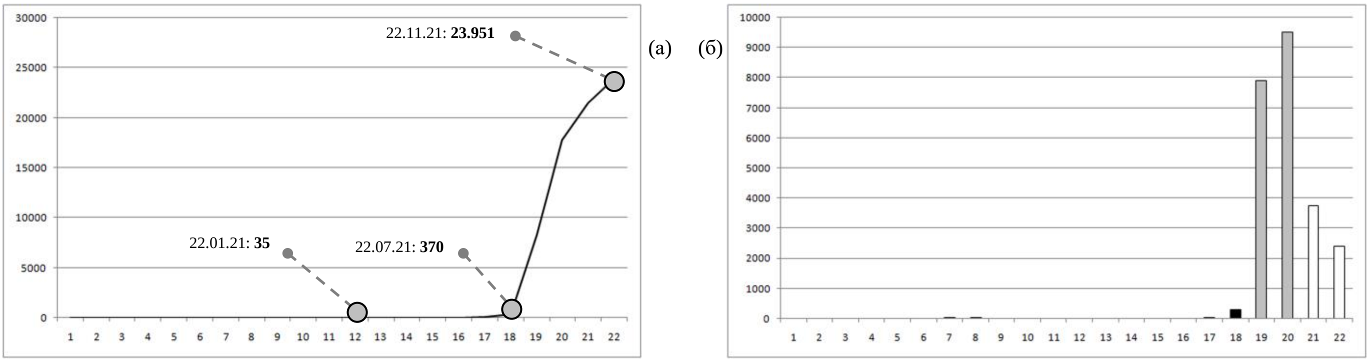
а) Динамика совокупного числа людей, умерших от COVID-19 в Великобритании.
б) Ежемесячное число смертей, связанных с COVID-19 в Великобритании.

Венгрия



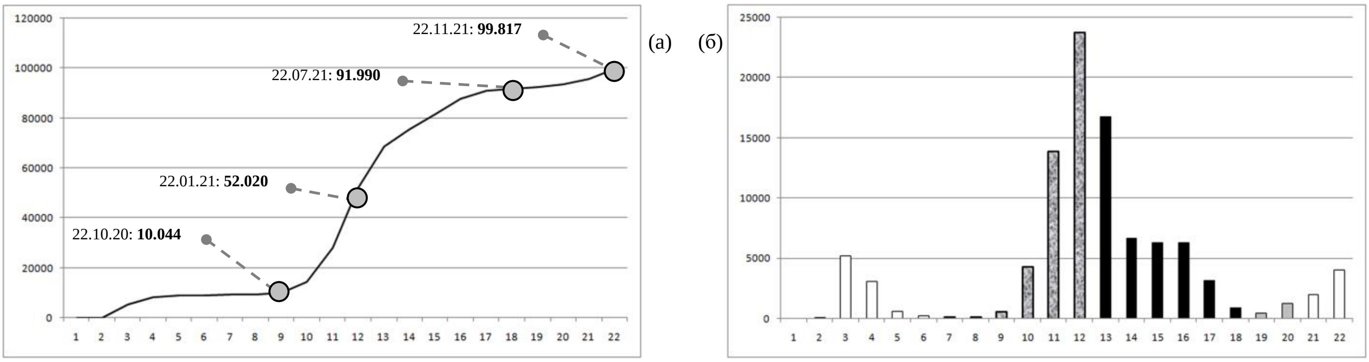
а) Динамика совокупного числа людей, умерших от COVID-19 в Венгрии.
б) Ежемесячное число смертей, связанных с COVID-19 в Венгрии.

Вьетнам



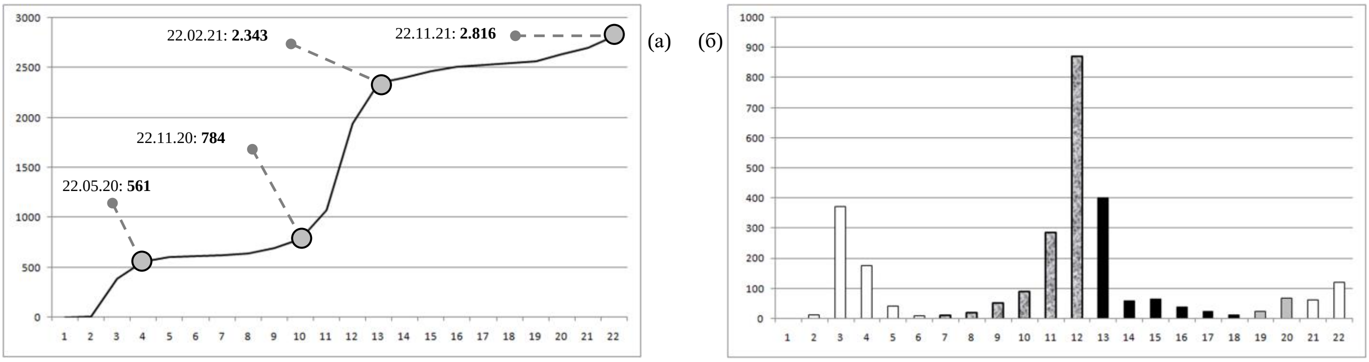
а) Динамика совокупного числа людей, умерших от COVID-19 во Вьетнаме.
б) Ежемесячное число смертей, связанных с COVID-19 во Вьетнаме.

Германия



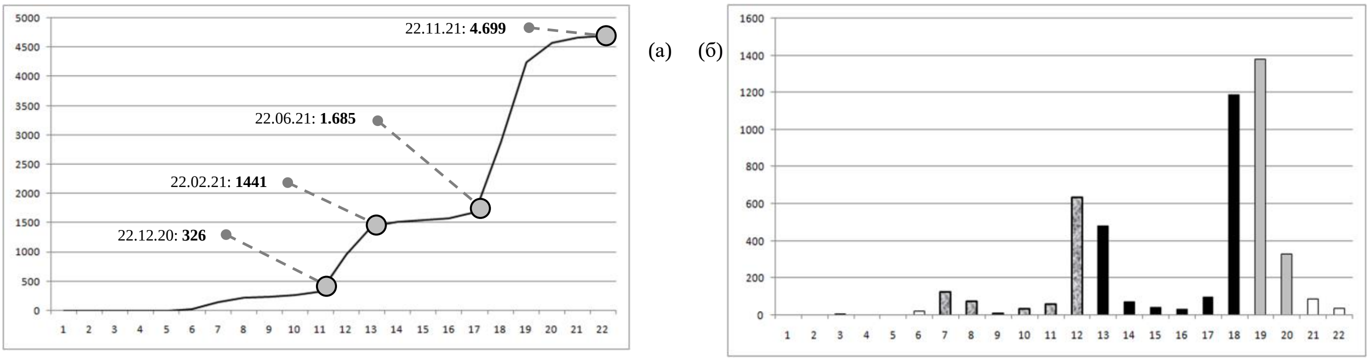
а) Динамика совокупного числа людей, умерших от COVID-19 в Германии.
б) Ежемесячное число смертей, связанных с COVID-19 в Германии.

Дания



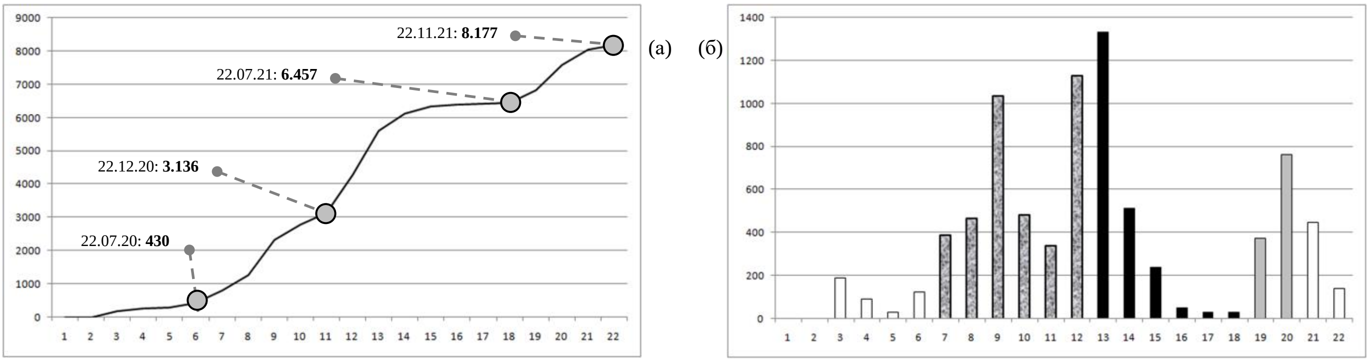
а) Динамика совокупного числа людей, умерших от COVID-19 в Дании.
б) Ежемесячное число смертей, связанных с COVID-19 в Дании.

Зимбабве



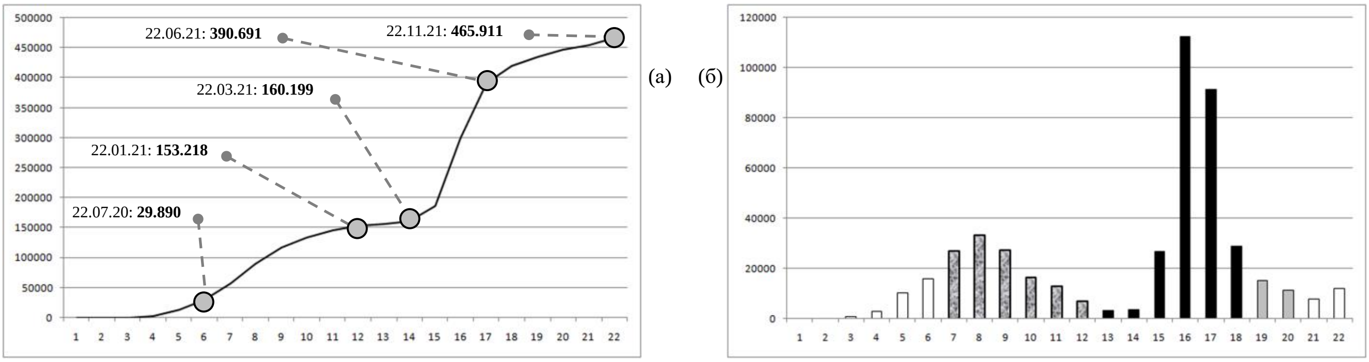
а) Динамика совокупного числа людей, умерших от COVID-19 в Зимбабве.
б) Ежемесячное число смертей, связанных с COVID-19 в Зимбабве.

Израиль



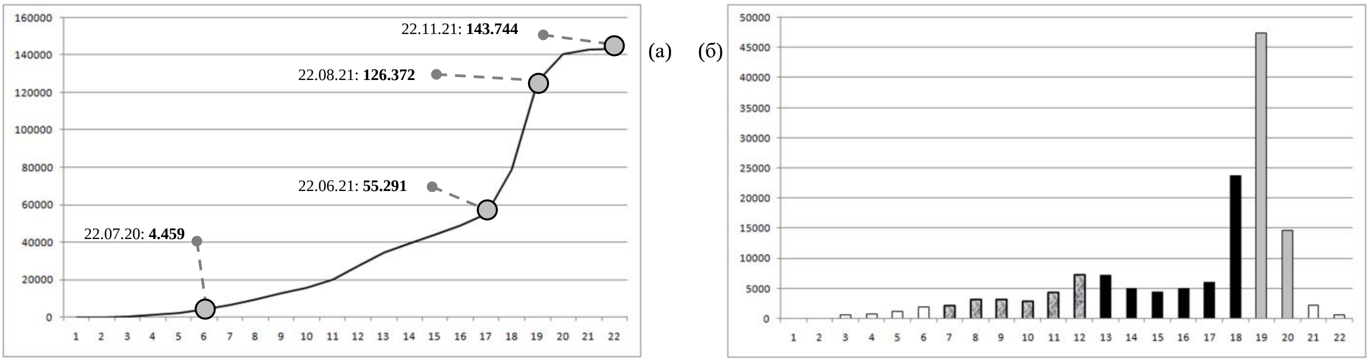
а) Динамика совокупного числа людей, умерших от COVID-19 в Израиле.
б) Ежемесячное число смертей, связанных с COVID-19 в Израиле.

Индия



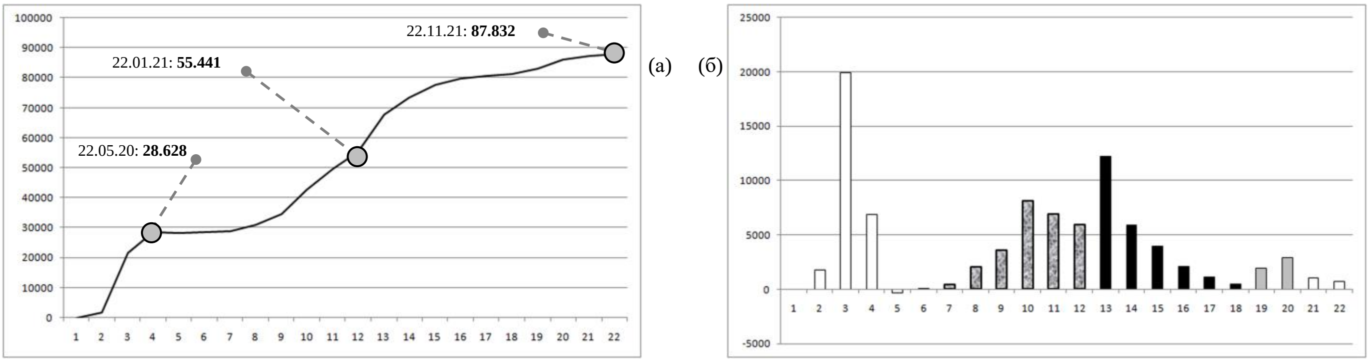
а) Динамика совокупного числа людей, умерших от COVID-19 в Индии.
б) Ежемесячное число смертей, связанных с COVID-19 в Индии.

Индонезия



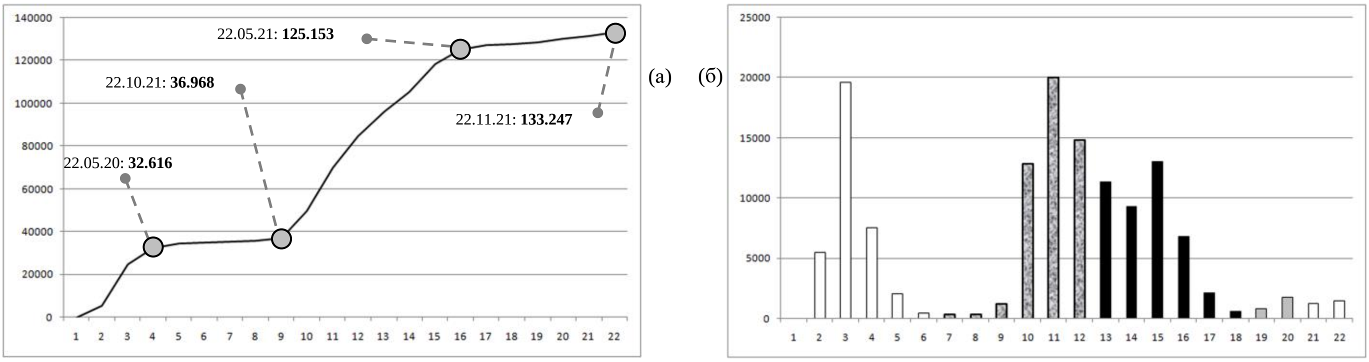
а) Динамика совокупного числа людей, умерших от COVID-19 в Индонезии.
б) Ежемесячное число смертей, связанных с COVID-19 в Индонезии.

Испания



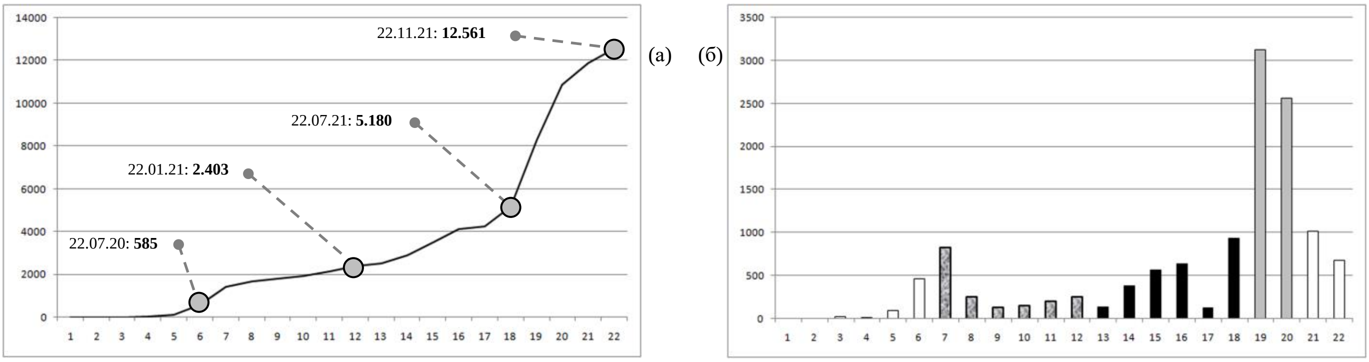
а) Динамика совокупного числа людей, умерших от COVID-19 в Испании.
б) Ежемесячное число смертей, связанных с COVID-19 в Испании.

Италия



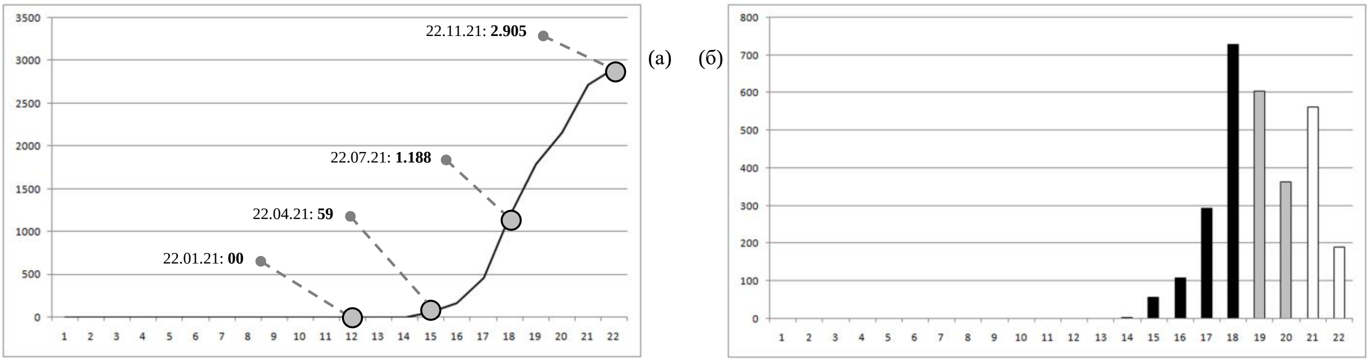
а) Динамика совокупного числа людей, умерших от COVID-19 в Италии.
б) Ежемесячное число смертей, связанных с COVID-19 в Италии.

Казахстан



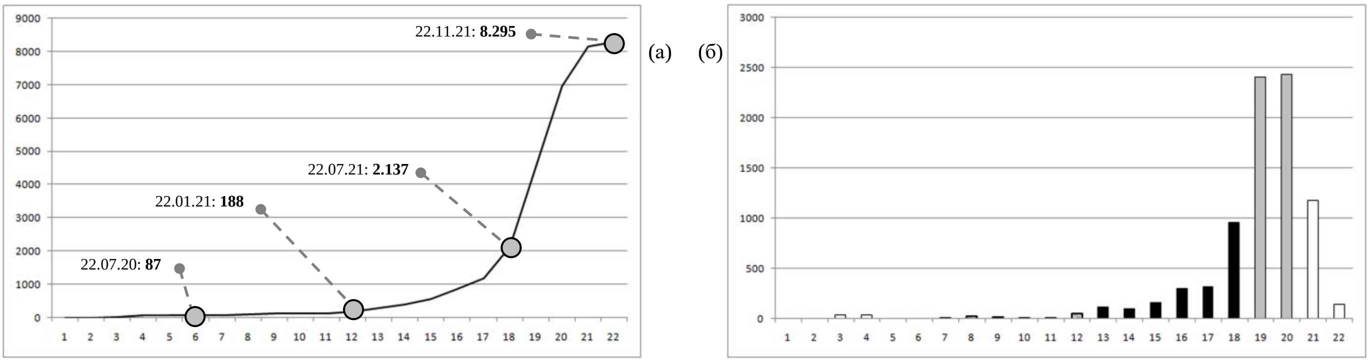
а) Динамика совокупного числа людей, умерших от COVID-19 в Казахстане.
б) Ежемесячное число смертей, связанных с COVID-19 в Казахстане.

Камбоджия



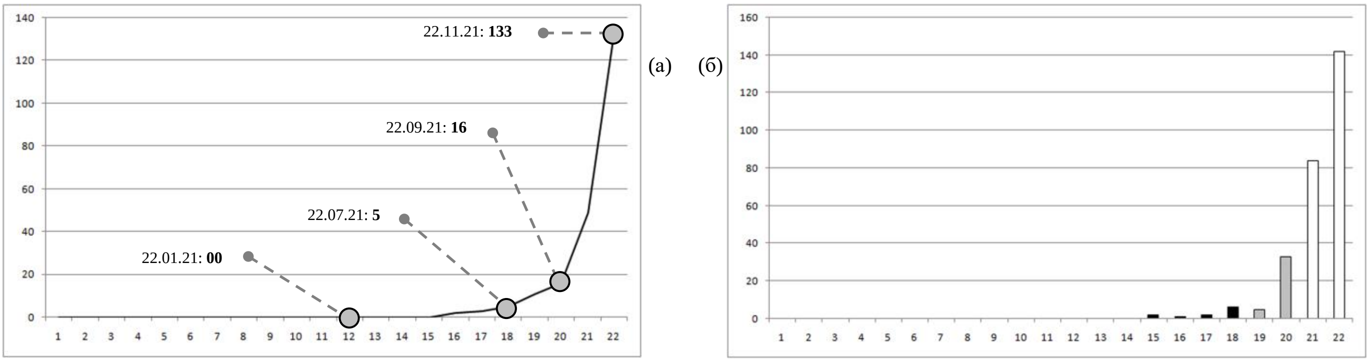
а) Динамика совокупного числа людей, умерших от COVID-19 в Камбодже.
б) Ежемесячное число смертей, связанных с COVID-19 в Камбодже.

Куба



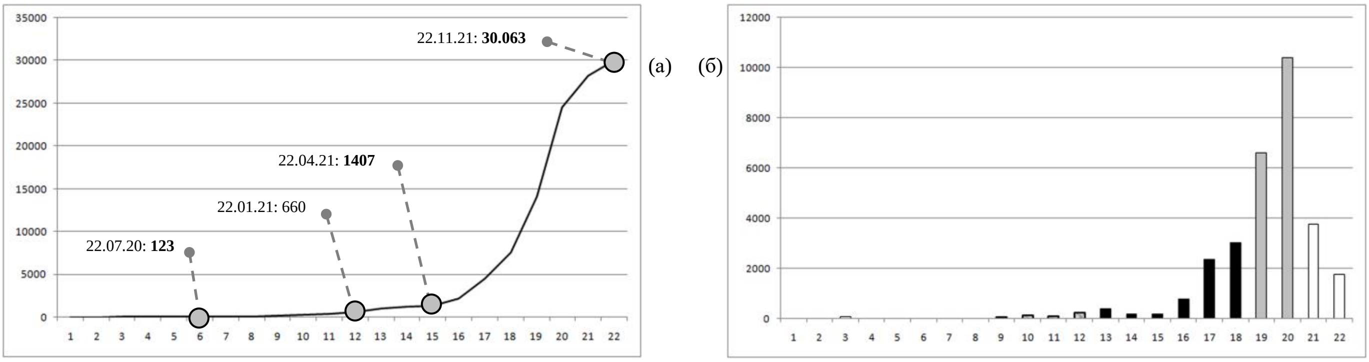
а) Динамика совокупного числа людей, умерших от COVID-19 в Кубе.
б) Ежемесячное число смертей, связанных с COVID-19 в Кубе.

Лаос



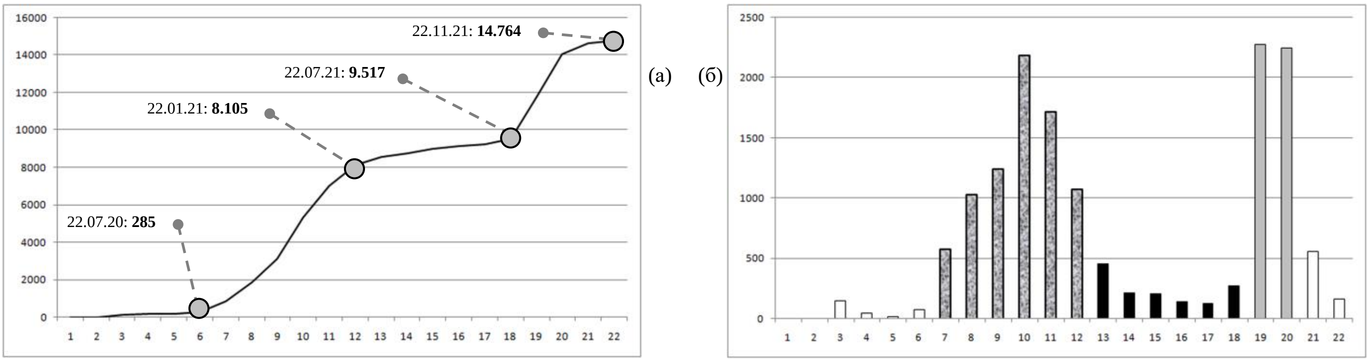
а) Динамика совокупного числа людей, умерших от COVID-19 в Лаосе.
б) Ежемесячное число смертей, связанных с COVID-19 в Лаосе.

Малайзия



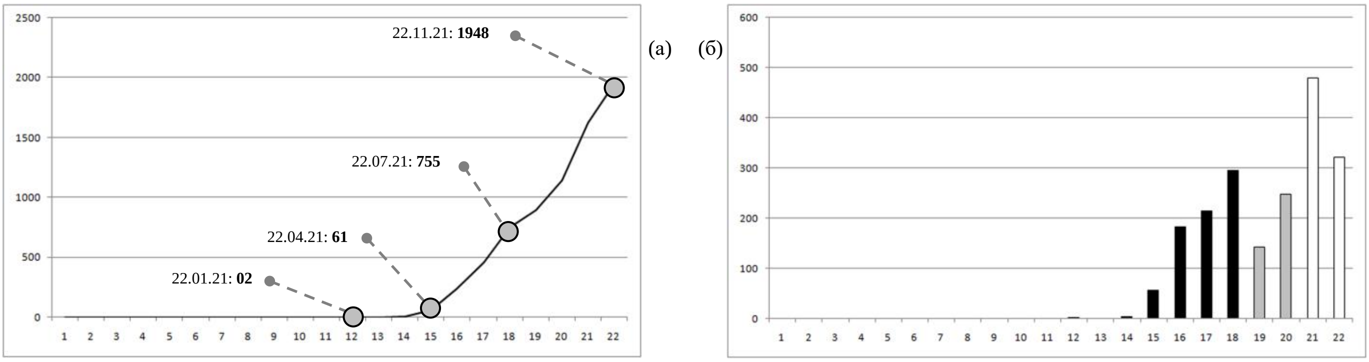
а) Динамика совокупного числа людей, умерших от COVID-19 в Малайзии.
б) Ежемесячное число смертей, связанных с COVID-19 в Малайзии.

Марокко



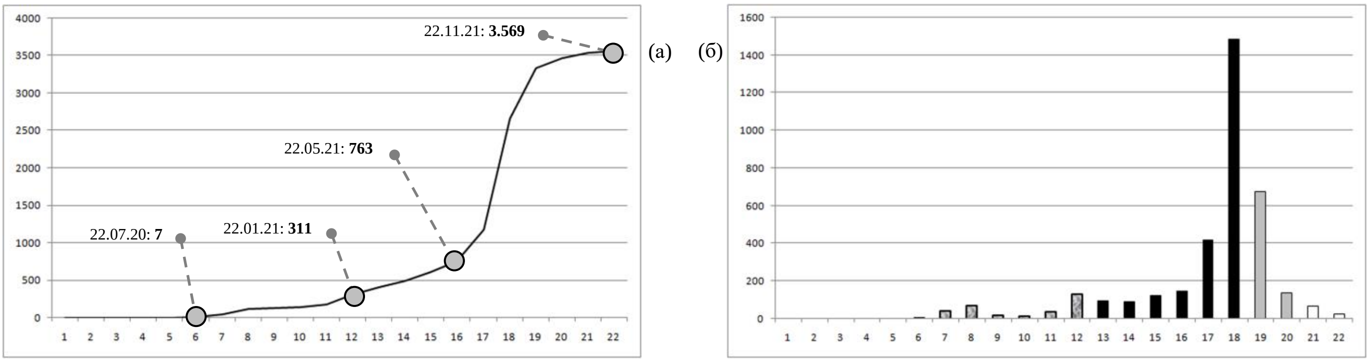
а) Динамика совокупного числа людей, умерших от COVID-19 в Марокко.
б) Ежемесячное число смертей, связанных с COVID-19 в Марокко.

Монголия



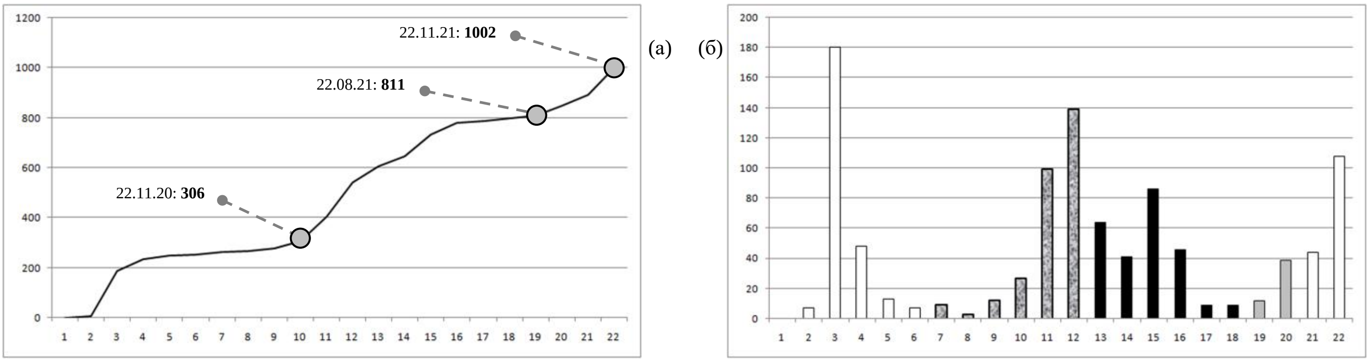
а) Динамика совокупного числа людей, умерших от COVID-19 в Монголии.
б) Ежемесячное число смертей, связанных с COVID-19 в Монголии.

Намибия



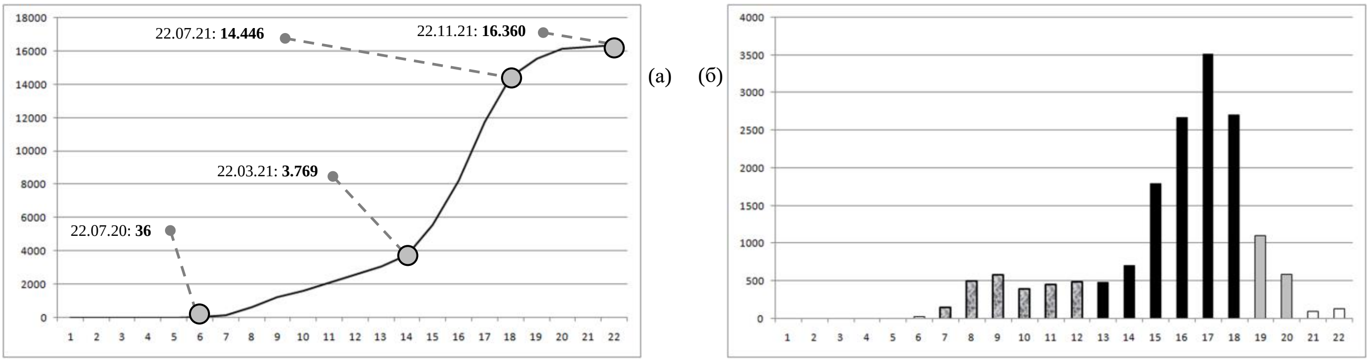
а) Динамика совокупного числа людей, умерших от COVID-19 в Намибии.
б) Ежемесячное число смертей, связанных с COVID-19 в Намибии.

Норвегия



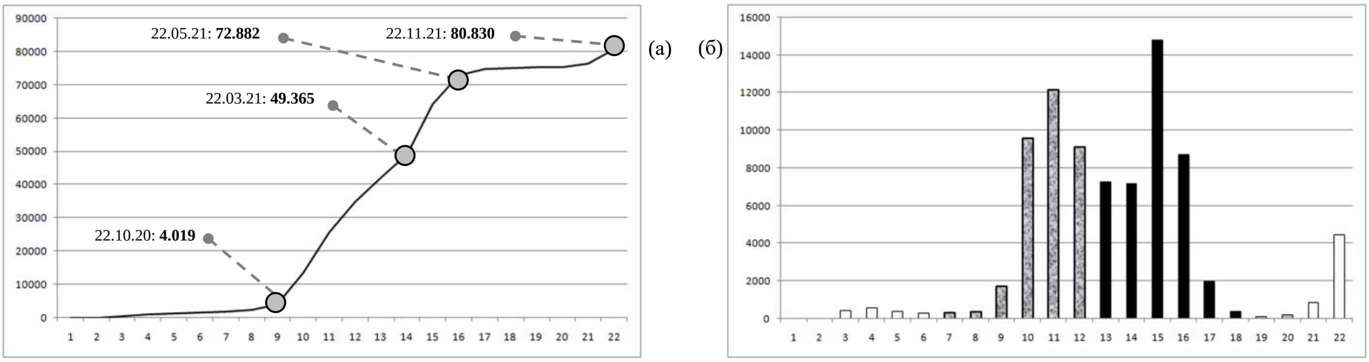
а) Динамика совокупного числа людей, умерших от COVID-19 в Норвегии.
б) Ежемесячное число смертей, связанных с COVID-19 в Норвегии.

Парагвай



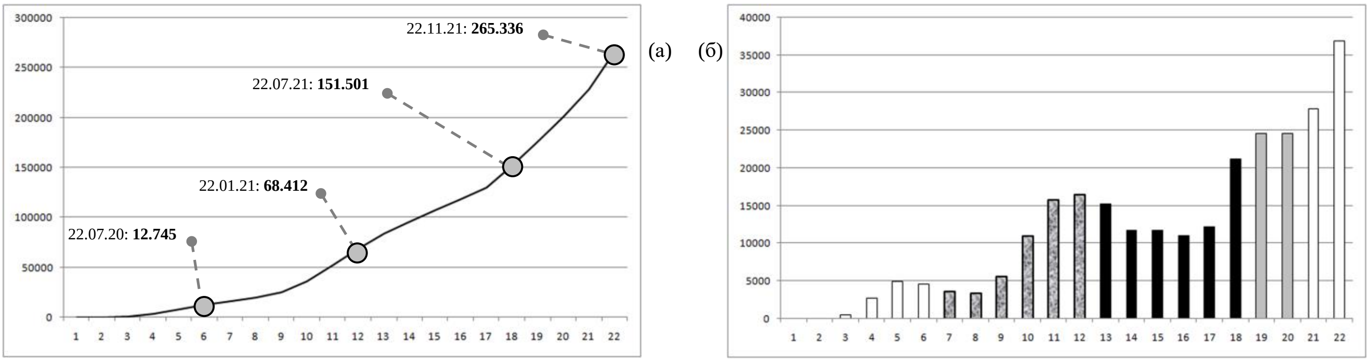
а) Динамика совокупного числа людей, умерших от COVID-19 в Парагвае.
б) Ежемесячное число смертей, связанных с COVID-19 в Парагвае.

Польша



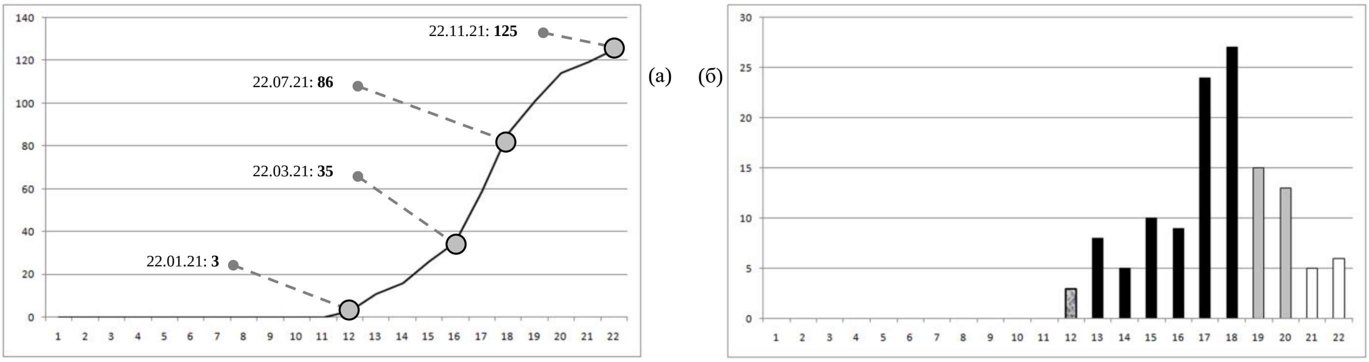
а) Динамика совокупного числа людей, умерших от COVID-19 в Польше.
б) Ежемесячное число смертей, связанных с COVID-19 в Польше.

Россия



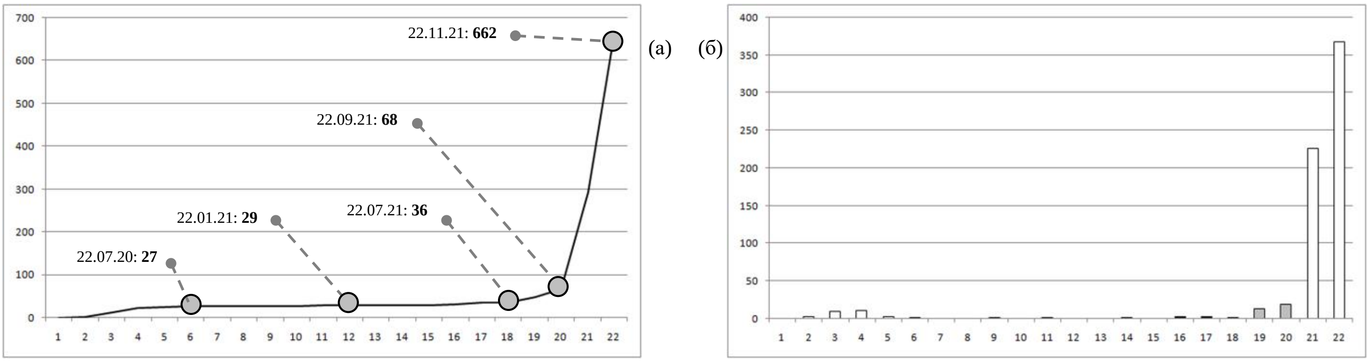
а) Динамика совокупного числа людей, умерших от COVID-19 в России.
б) Ежемесячное число смертей, связанных с COVID-19 в России.

Сейшелы



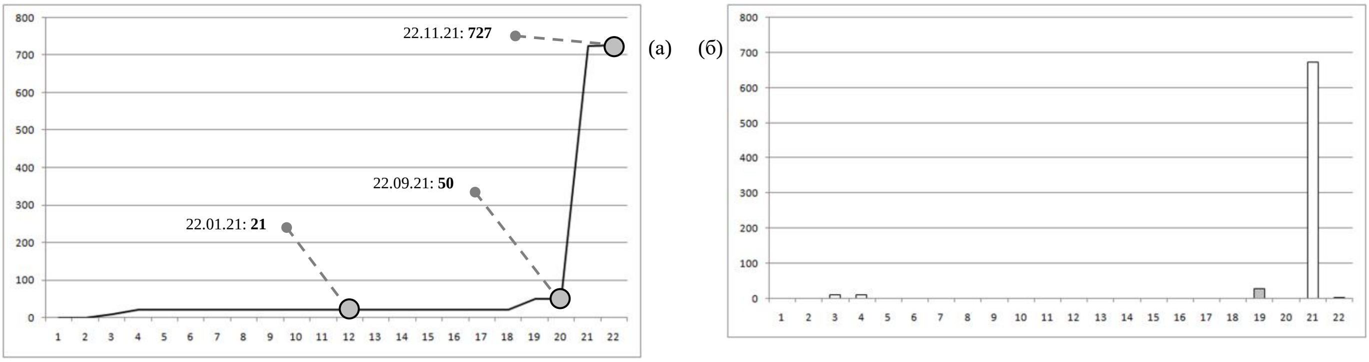
а) Динамика совокупного числа людей, умерших от COVID-19 на Сейшелах.
б) Ежемесячное число смертей, связанных с COVID-19 на Сейшелах.

Сингапур



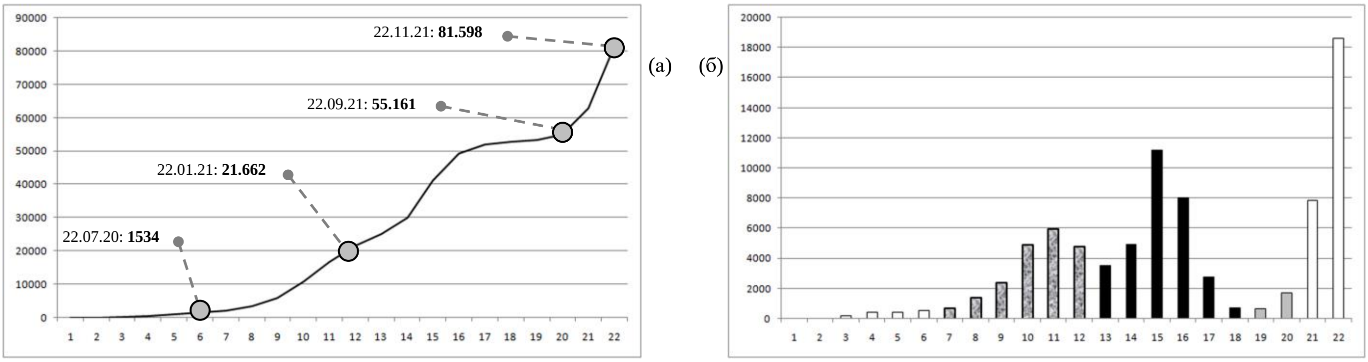
а) Динамика совокупного числа людей, умерших от COVID-19 в Сингапуре.
б) Ежемесячное число смертей, связанных с COVID-19 в Сингапуре.

Танзаний



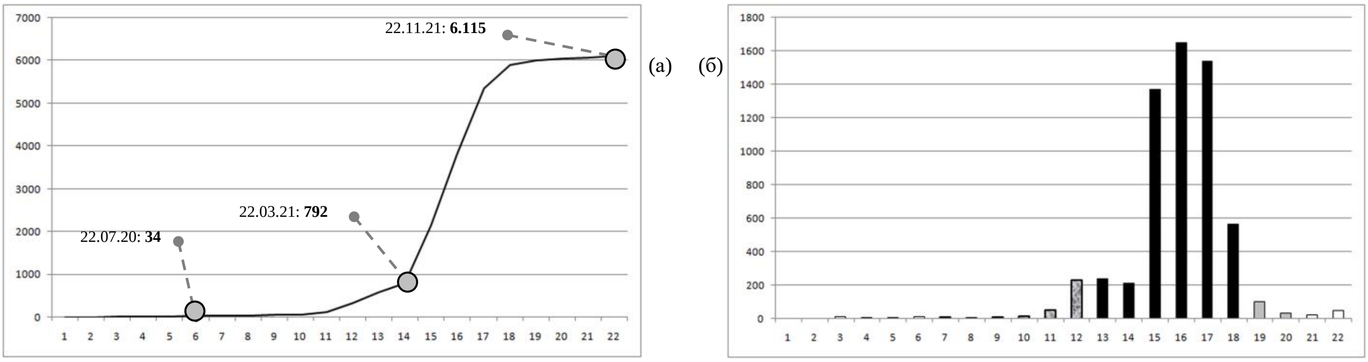
а) Динамика совокупного числа людей, умерших от COVID-19 в Танзании.
б) Ежемесячное число смертей, связанных с COVID-19 в Танзании.

Украина



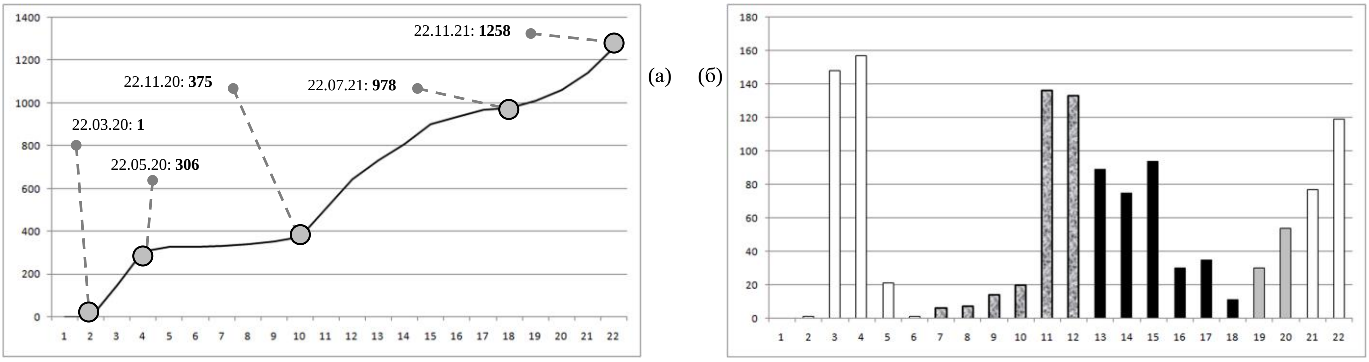
а) Динамика совокупного числа людей, умерших от COVID-19 в Украине.
б) Ежемесячное число смертей, связанных с COVID-19 в Украине.

Уругвай



а) Динамика совокупного числа людей, умерших от COVID-19 в Уругвае.
б) Ежемесячное число смертей, связанных с COVID-19 в Уругвае.

Финляндия



22.11.21: **1258**

22.11.20: **375**

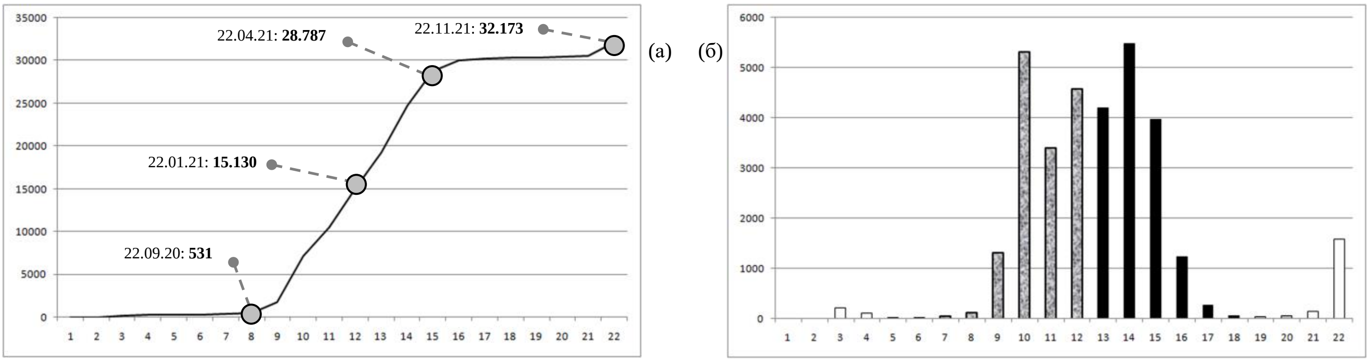
22.07.21: **978**

22.03.20: **1**

22.05.20: **306**

а) Динамика совокупного числа людей, умерших от COVID-19 в Финляндии.
б) Ежемесячное число смертей, связанных с COVID-19 в Финляндии.

Чехия



22.04.21: **28.787**

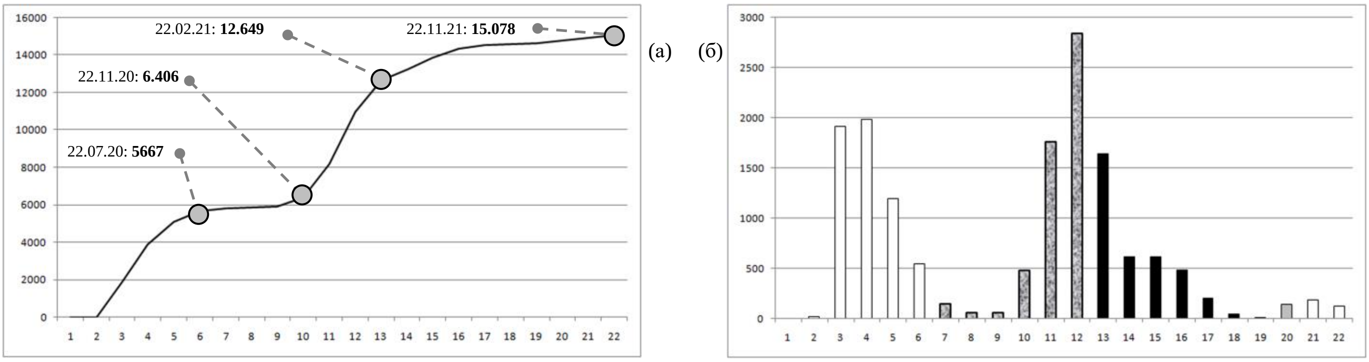
22.11.21: **32.173**

22.01.21: **15.130**

22.09.20: **531**

а) Динамика совокупного числа людей, умерших от COVID-19 в Чехии.
б) Ежемесячное число смертей, связанных с COVID-19 в Чехии.

Швеция



22.02.21: **12.649**

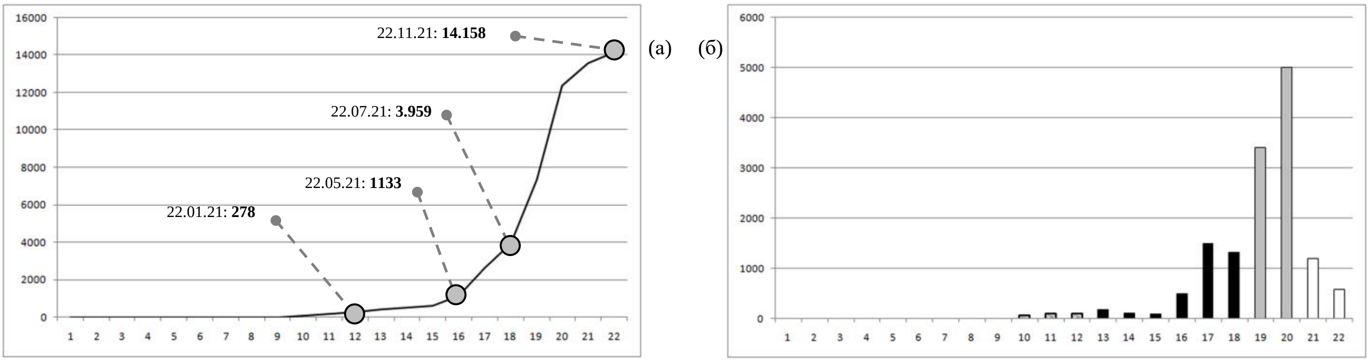
22.11.21: **15.078**

22.11.20: **6.406**

22.07.20: **5667**

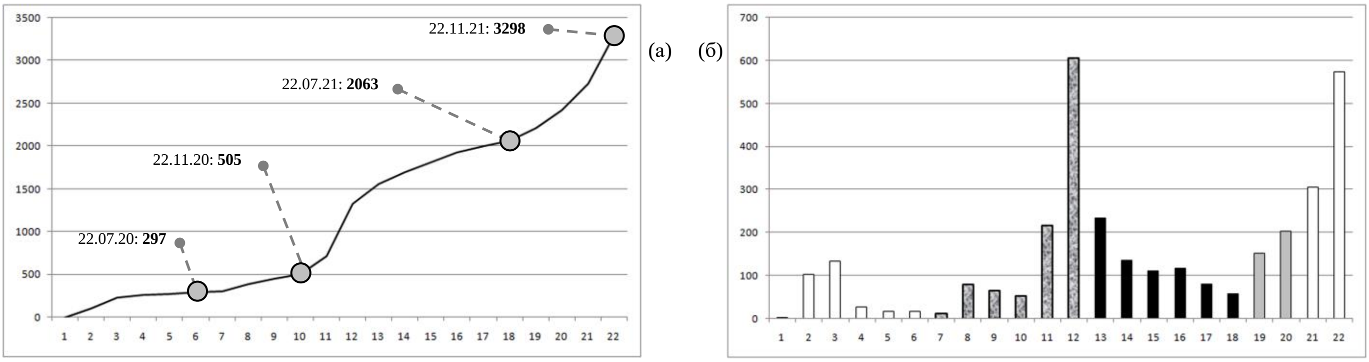
а) Динамика совокупного числа людей, умерших от COVID-19 в Швеции.
б) Ежемесячное число смертей, связанных с COVID-19 в Швеции.

Шри-Ланка



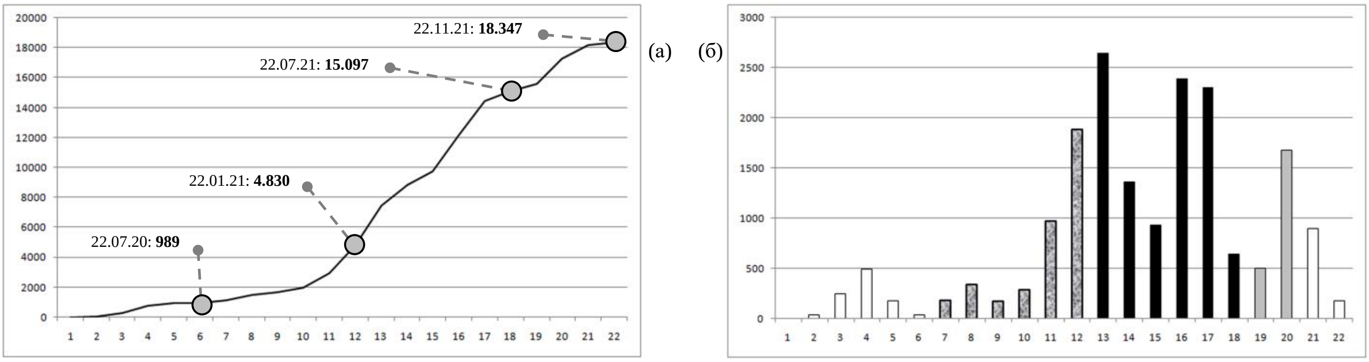
а) Динамика совокупного числа людей, умерших от COVID-19 в Шри-Ланке.
б) Ежемесячное число смертей, связанных с COVID-19 в Шри-Ланке.

Южная Корея



а) Динамика совокупного числа людей, умерших от COVID-19 в Южной Корее.
б) Ежемесячное число смертей, связанных с COVID-19 в Южной Корее.

Япония



а) Динамика совокупного числа людей, умерших от COVID-19 в Японии.
б) Ежемесячное число смертей, связанных с COVID-19 в Японии.

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COVID-19: Three Phases of the Pandemic
Dynamics of cases, deaths and tests related to SARS-CoV-2
A systematic analysis of 213 countries and territories

Mikhail Teppone

Background

Since the previous study dealing with the case fatality ratio and infection fatality ratio caused by COVID-19,[1] the author has received many comments that prompted the question: "Why did an optimistic prognosis fail?" To answer this question, a more detailed and expanded analysis was carried out in a new study.

1. Introduction

1.1. Initial and current state of the COVID-19 pandemic narrative

On December 31, 2019, the WHO's China Country Office was alerted to cases of pneumonia of unknown cause detected in Wuhan City, Hubei Province of China.[2] On January 3, 2020, the first complete genome of the novel coronavirus (2019-nCoVs) was identified.[3] On February 11, 2020, a new disease was named "the coronavirus disease 2019" or CoViD-19.[4] Further studies revealed that SARS-CoV-2 was circulating in various countries, including Spain,[5] Italy,[6] India,[7] France,[8] USA,[9] etc. before the outbreak of the epidemic in China.[10-11]

During the initial stage of the COVID-19 pandemic two well-known discoveries, namely: "Unique inserts in the 2019-nCoV spike protein" and "Reduction and functional exhaustion of T-Cells" in COVID-19 patients,[12-13] were published. These discoveries demonstrated structural and functional similarities between two viruses and prompted a common sense question about the origin of SARS-CoV-2.[14-15] Questions about the origins of the virus resurfaced in December 2020 when production of an Australian vaccine was discontinued as healthy vaccinated people became tested positive for HIV.[16]

Other issues related to the epidemic curve that had anomalous evolution include:

(1) *New patterns*:

In April 2020, an expert in epidemiology, Prof. Vladimir Nikiforov mentioned: "if the virus followed the 'classical pattern', the epidemic would have ended within three months, but now we are faced with something new".[17]

(2) *Data adjustments*:

During the first half of the pandemic there were many cases of local number adjustments that affected the worldwide statistics related to COVID-19.[18] (Fig. 1)

On April 26, 2020, a cumulative report of Palestine was reduced by 153 cases; on May 25, 2020, a report of Spain was reduced by 1915 deaths; on June 3, 2020, a report of France was reduced by 37,895 cases; on June 20, 2020, a report of Mayotte was reduced by 787 cases; on August 13, 2020, a report of the United Kingdom was reduced by 29,726 cases and by 5,319 deaths.[18] (Fig. 2)

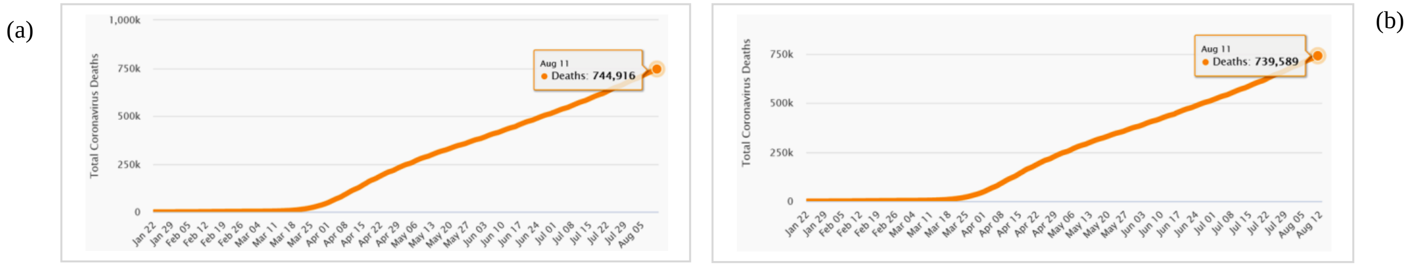

Figure 1. Worldometer: Adjustment of the worldwide cumulative number of deaths.[18]
These are two screenshots dated (a) August 12, 2020, 07:27 GMT; and (b) August 13, 2020, 09:18 GMT.
The total number of deaths decreased suddenly from 744,916 to 739,589 cases.

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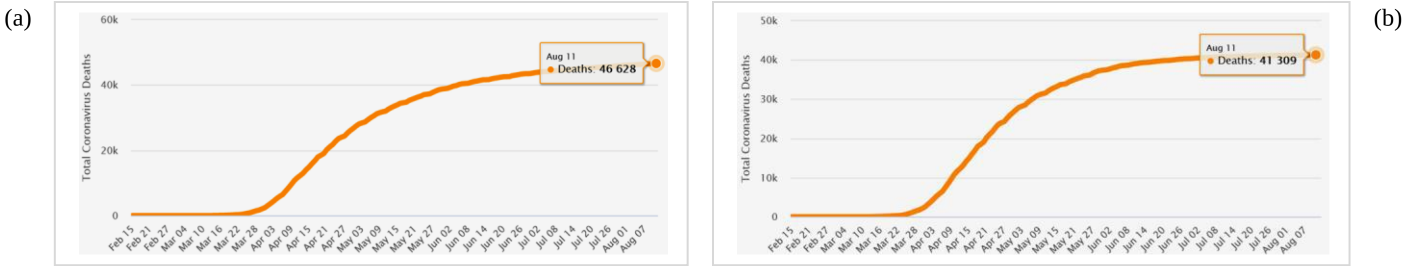

Figure 2. Worldometer: Adjustment of cumulative number of deaths in the United Kingdom.[18]
These are two screenshots dated (a) August 12, 2020, 07:34 GMT; and (b) August 13, 2020, 08:19 GMT.

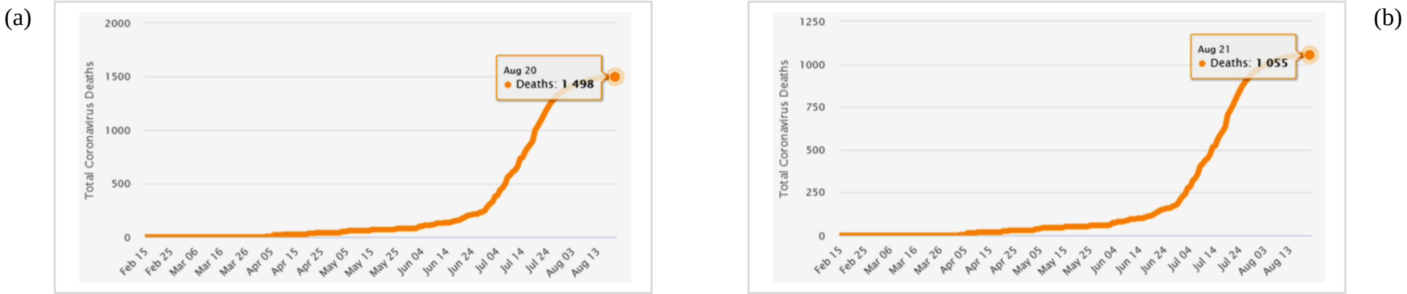

Figure 3. Worldometer: Adjustment of cumulative number of deaths in Kyrgyzstan.
These are two screenshots dated (a) August 21, 2020, 08:21; and (b) August 22, 2020, 08:04 GMT.[18]

On August 14, 2020, a report of Peru increased by 3,935 new deaths; on August 21, 2020, the number of deaths in Kyrgyzstan, decreased by 443 cases (Fig. 3); on September 24, 2020, a record of Liberia, decreased by 133 cases,[18] etc. Similar adjustments took place during the later period of the pandemic: on July 2, 2021, it was reported, "Santa Clara County's COVID-19 death toll drops by 505",[20] and so on.

(3) *A synchronization-like phenomena*:

The first example of synchronization was a weekly mortality cycle which was noticed in June 2020,[21] later this anomalous cycle of daily death became obvious and steady.[22] A comparison of the percentage of fatal cases on different days of the week for a period of 100 weeks (26.01.20-25.12.21) revealed almost identical distribution as described in a previous study.[22] (Fig. 4).

There is another example of synchronization related to the daily new cases of COVID-19. During 1.5 years of the pandemic the highest number of daily new cases in the United States and the United Kingdom were recorded on the same day, on January 8, 2021; together they accounted for 44% of the total number of new cases worldwide.[18]

(4) *A Strange evolution of the pandemic*:

In mid December 2021, a well-known expert in infectious diseases, Dr. Anthony Fauci, said: "it's 'unprecedented' how long the COVID-19 pandemic has lasted globally, with many countries enduring multiple major waves of infections since it was declared in March 2020".[23] So, a pertinent question that pops up is: why, despite unprecedented control measures to prevent the spread of a new virus, including worldwide quarantines, isolation, movement control order, curfew, social distancing, wearing of masks and mass vaccinations, the epidemic curve still has a 'wave-like' or 'propagated' shape instead of going down? Were preventive measures effective, or simply useless or harmful?

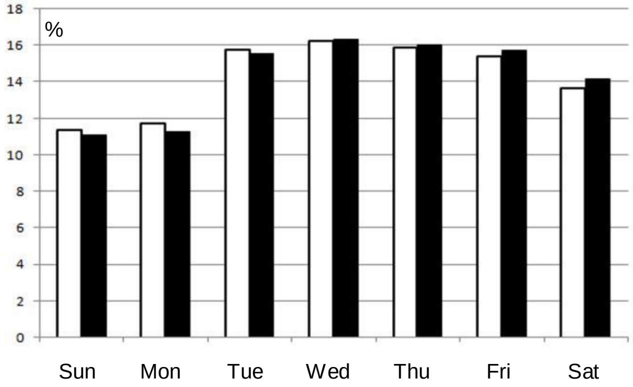

Figure 4. Global mortality due to COVID-19 on various days of the week: white columns - period of 100 weeks (26.01.20-25.12.21); black columns – period of 40 weeks (01.03.20-05.12.20). The vertical axis shows percentages; the horizontal axis shows days of the week.

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1.2. Infectious disease – a battle between the human body's defense and viruses or bacteria

History of the battle against viruses and bacteria goes back at least several thousand years. Ancient physicians already knew about external pathogens which could cause acute febrile diseases. They also knew that an evolution of any clinical case depended on the health status of the patient before the onset of the disease, so they talked about "body defense".[24] At the beginning of modern microbiology the importance of body resistance was confirmed by a Prof. Max von Pettenkofer, who swallowed the entire contents of a tube filled with germs of cholera, but nothing happened to him. So he claimed: "The important thing is the *disposition* of the individual!"[25]

Despite a variety of external pathogens, the human body has a limited number of defense mechanisms, which is accompanied by a few clinical syndromes, consisting of common symptoms, such as fatigue, chills or hot feeling, headache, cough, shortness of breath, nausea, vomiting, diarrhea, skin rashes or discoloration of the skin, etc.

In ancient times the mechanism of the onset of fever was differentiated into two main groups based on the presence of thirst, sweating, chills, or feelings of heat; and the choice of individual treatment was determined by the type of fever. According to the modern view on fever, which commonly accompanies infectious diseases, one can define only two mechanisms leading to an increase in temperature: one is an increase in heat production and another, a decrease in heat transfer, or their combination.[26] Thus ancient and modern explanations of fever are quite similar, and two types of antipyretic medicines are necessary and sufficient to manage any case of excessive fever. Similarly, 2-3 mechanisms can be identified that underlie each of the remaining symptoms of any acute viral disease, so, a small group of commonly used drugs would be sufficient to manage any infectious diseases, including *old* and *new* ones.

After the discovery of bacteria and viruses as a cause of infectious diseases the main emphasis was changed from supporting the body resistance to the fighting against pathogens. It was successful in the majority of bacterial infection cases, but it was almost useless when disease was caused by a virus.

Therefore, if there is no etiotropic treatment, then there is no need to identify a *new* viral disease. All pharmaceutical and non-pharmaceutical therapeutic modalities would be addressed to the well-known protective mechanisms of the human body, and treatment should be based on the leading syndromes and symptoms, using the principle called *off label* therapy.

1.3. The classical foundation of medicine is wisdom, which is evergreen

Multiplication tables, the Pythogorean theorem, Archimedes' law, ideas of inertia and atomic structure of matter appeared several thousand years ago. In the course of history ancient knowledge developed and improved until it turned into higher Mathematics and quantum Physics, however, the multiplication table, Archimedes' law and other basic knowledge have not lost their value in our time.

Similarly, ancient medicine also had its own canon, preserved within the framework of traditional Chinese medicine. The most important law of that canon was postulate: to strengthen or reinforce that which is *deficient*, and drain or sedate that which is *excessive*.[27] Over the centuries, it has taken on new forms, and was introduced in the theory of *asthenic* and *sthenic* diseases by Dr. John Brown.[28] At the beginning of the 20th century, two physiologists presented this postulate in the form of theories of *parabiosis*[29] and *dominant*.[30] In the 1930s, Hans Selye discovered a dynamic interaction between excess and deficiency, and described General Adaptation Syndrome theory, which distinguished the *alarm phase* (= excess, sthenic disease, dominant) and *exhaustion phase* (= deficiency, asthenic disease, parabiosis).[31-32]

At the beginning of organotherapy[33-34] doctors used extracts of animal organs to treat various age-related problems, nowadays called *frailty*.[35-36] Later a modern branch of organotherapy, taking the form of hormonotherapy, became a powerful tool to treat various diseases caused by hormonal insufficiency.[37-38] They followed the first part of the ancient postulate: *to strengthen or reinforce that which is deficient*. When antibiotics were discovered, physicians got a tool to inhibit bacterial growth.[39] Application of antibiotics was an example of following the second ancient postulate: *drain or sedate that which is excessive*. But further development of medicine did not follow the basic canon.

Nowadays despite the fact that *deficiency* patterns are the causes of the majority of chronic diseases, especially among elderly people, antagonists, blockers, or inhibitors, such as α-blockers, β-blockers, calcium channel blockers, ACE inhibitors, PDF-5 inhibitors, and H2 antagonists are used for therapy. Before prescribing sedative therapy patients are not tested whether the corresponding target is in an excited state or not. So, a rational medical sense is ignored and patients have to take medication for all their life.

The same problem has arisen with the treatment of COVID-19. The main pathologic target was T-cell immune-deficiency,[13,40-41] nevertheless a lot of attention was paid to the cytokine storm which was a consequence, but not a primary cause. According to basic medical law, treatment should be focused more at restoring T-cell immunity,[42] and less against increased activity of certain components of the immune system.

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1.4. Treatment of patients suffering from acute infectious diseases

About 1800 years ago, Dr. Zhang Zhongjing summarized the results of research from previous generations and developed a theory of acute infectious diseases, which explained therapy based on leading clinical symptoms and syndromes.[43] According to this theory, there could be only 6 phases, and certain phases could have 2-3 variants. Thus, the whole variety of clinical syndromes related to infectious diseases was limited to 10-12 variants, each having specific treatment and prevention. (Fig. 5.b)

(a) Phases of Defense System Affection	**(b) Six Phases of Acute Infectious Diseases**			**(c) General Adaptation Syndrome by H. Selye**
Activation of defense	1.	*Tai Yang*	- Common cold symptoms	**Alarm Phase**
Unstable phase	2.	*Shao Yang*	- Unstable phase	
Highest activity of defense	3.	*Yang Ming*	- Progressive fever	
Exhaustion of defense	4.	*Tai Yin*	- Beginning of exhaustion	**Exhaustion Phase**
	5.	*Shao Yin*	- Hemorrhagic syndrome, and other complications	
	6.	*Jue Yin*		

Figure 5. A comparison between various theories which describe phase evolution of acute infectious diseases:
(a) Four phases of diseases caused by external physical or biological pathogens called "excessive heat".[44]
(b) Six phases of diseases caused by various external physical, chemical or biological pathogens.[43]
(c) Two phases of diseases according to the general adaptation syndrome discovered by Hans Selye.[31-32,45]

There are some examples of treatment of the initial phases of infectious diseases: in the case of initial fever with general cold feelings without sweating – *Herba Ephedrae* was recommended; if there is initial fever with general hot feelings – *Folium Mori Albae* or *Herba Menthae Haplocalycis* should be used; if there is initial fever with intensive sweating or tension in the muscles – *Ramulus Cinnamomi Cassiae* was recommended; in the case of fever with alternating cold and hot feelings – *Radix Bupleuri*, was used, etc.[43] (Fig. 5.b). A change in symptoms pointed to a change in the phase of the disease and required an adjustment of therapy. If a patient has a severe fever with hemorrhagic symptoms, skin rashes, kidney and liver impairment, delirium, etc. – *Radix of Isatis tinctoria* should be applied.[44,46] (Fig. 5.a)

It would be useful for modern pathophysiology to distinguish between various types of the fever and choose antipyretic medicines (paracetamol, ibuprofen, etc) based on the pharmacodynamic of these popular drugs, but not empirically, as they are usually used.[47]

During later centuries, protocols of infectious disease treatment were updated according to the new scientific discoveries of that time. Excepting deadly epidemic diseases (plague, smallpox, or cholera), therapy of other infectious diseases was effective and successful. Theoretically, modern medicine having a long history in the past and advanced pharmaceutical science nowadays must be able to treat any problem more effectively than our predecessors, but the helplessness of the modern medical system during the current pandemic was beyond common sense,[48] and raised a question about the quality of medical education of the distinguished leaders and their followers.

1.5. Treatment of COVID-19 at initial phase of pandemic

At the beginning of the pandemic, WHO encouraged doctors to use well-known medicines as *off-label* treatment of a new disease since there were no approved drugs yet for the treatment of COVID-19.[49] The majority of knowledgeable and experienced doctors who received high quality medical education treated patients suffering from COVID-19 with great success. They recommended using anticoagulants, such as dipyridamole[50] or heparine;[51] antiviral and anti-inflammatory drugs, including ivermectin,[52-53] colchicine,[54-55] methylene blue,[56-57] chloroquine and hydroxychloroquine;[58-60] immune-modulators, such as thymic extracts,[61] thymic peptides,[62] solution of Formaldehyde,[63] melatonin[64] and common adjuvants.[65] A group of physicians, who had identified the similarity between COVID-19 and toxic damage to red blood cells, recommended to use therapeutic protocol which was effective in cases of acute intoxication.[66] Other experts recommended an inhalation with ethanol vapor[67-68] and helium-oxygen mixture,[69] since those methods had already been applied to similar cases before.[70-72] Plant derived medicines, including extracts of Artemisia, Isatis or Colchicum as well as green and black tea, and various complex prescriptions were also used either for prophylaxis or for combined therapy.[73-78]

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During the early days of the COVID-19 epidemic, doctors in Russia used their own treatment protocols, that resulted in very low mortality, and even raised questions and skepticism from the international medical community.[79-80] For example, in April-June 2020, in a hospital attached to the Moscow State University, 420 out of 424 indoor patients suffering from COVID-19 were successfully treated with routine medication. Effectiveness of the therapy was around 100%.[81]

As basic medicines these doctors used Colchicine, Dipyridamole, Bromhexine, and Spironolactone; additional application of certain anticoagulants and corticosteroids depended on a particular case.[82] Thus, common medical knowledge and experience were enough to treat the infectious disease caused by the *new* virus.

Every doctor knows that effective therapy of any patient requires individual approach due to the natural difference between even two *similar* cases, especially if a patient suffers from COVID-19.[83] Following standard protocols without dose adjustment and individual correction of used medicines in certain clinical trials resulted in decreasing or even losing effectiveness of the drugs that had been used by other doctors earlier on.[84] Nevertheless knowledgeable doctors continued their successful and effective treatment.[65,85-86] The therapeutic effects of the medicines mentioned above have been proven in further clinical trials and the results were published in peer-reviewed journals.[87]

After recent discussions on therapeutic protocols taking place between various experts, Dr. Peter A. McCullough recommended to his colleagues to treat COVID-19 patients according to their own knowledge and experience.[88] One can only deduce there is no common sense for doctors to follow the protocol of an expert or a country where mortality was high, otherwise they will gain the same high mortality among their patients.

1.6. Clinical trials

Early in the 18th century, homeopathic doctors, who studied *pathogenesis* of new remedies, introduced extensive and multi-centered clinical trials to the medical public. They needed to differentiate the primary and secondary symptoms, and to separate important symptoms from non-important ones, and so on. According to the demand of homeopathic pharmacy, there was a rationale for using large groups of people. Nevertheless extensive trials were criticized by Dr. Rudolf Virchow, the father of modern Pathology. He insisted that despite certain similarities in pathology discovered in different patients with a similar disease, each patient has his/her individual disease, so instead of using statistics collected from large groups of patients, doctors should pay more attention to detailed analysis of every particular case.[89]

As far as acute infectious diseases are concerned, their pathological condition is not stable, but has several phases. Each of the phases requires the use of different medicines and patient care. It would be illogical to look for the treatment of COVID-19 in general, but each phase of the disease requires an appropriate group of medicines. Then a doctor should choose one or two medicines taking into account the main symptoms of a certain patient. Multiple attempts to find a unique medicine against 'COVID-19' have failed. That means treatment of COVID-19 or any further new acute viral infectious diseases should be managed by means of routine drugs applied as *off label* therapy.

When COVID-19 was announced as a new disease,[4] healthcare worldwide was challenged to conduct new clinical trials to find medicines that were safe and effective in treating COVID-19 and comorbidities. After Dr. T. A. Ghebreyesus expressed an opinion about the pandemic,[48] all patients suspected of being infected with SARS-CoV-2 were automatically made participants of clinical trials which were the most extensive in the history of mankind.

Since all the pathogenic mechanisms encountered in COVID-19 were already well-known before April-May, 2020, the treatment of COVID-19 should not have been difficult.

Moreover, since some routine medicines had already been used successfully, the main goal of further clinical trials was to design the most effective and adjustable protocols, but not to reject the effects of the used medicines. That is why it is crucial that ongoing clinical trials should focus more on adjusting protocols to enhance the efficacy of the tested medicines, rather than adhering to some standard approach. Adhering to such rigid protocols might render the treatment of COVID-19 ineffective, not due to the ineffectiveness of the medicine per se but due to the inappropriate protocols applied. The trials also tested the ability of doctors to form homogeneous groups, taking into account the leading pathogenic mechanisms, presented among the patients in the group of study and the main therapeutic action of the studied medicine. Unfortunately, many ongoing clinical trials have ended up demonstrating insufficient knowledge and experience of the physicians conducting the research.

For experienced physicians with a solid background, clinical trials were not necessary. Since they knew the pathogenesis of COVID-19 and pharmacodynamic of the medicines used, in their clinics efficacy of therapy must be around 100%.[65,82,85,86] But results of clinical trials were very important and useful for beginners, since standard protocols help them to reduce the number of adverse reactions of their treatment.

1.7. Paradoxes of Clinical trials

There were some facts that would be worth paying attention to, since they could indicate possible causes of high mortality at the initial phase of the COVID-19 pandemic.

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In January-April, 2020, mortality among CoViD-19 patients who were treated with invasive mechanical ventilation (IMV) was higher than 80%, including, 81%,[90] 88.1%,[91] 92%,[92] and even 97%.[93] According to a review by G. Bellani, et al. published in 2016, the highest mortality among the severest cases of patients with Acute Respiratory Distress Syndrome (ARDS) of various origin, who were treated with IMV, was around 50%.[94]

After comparing the results of IMV application among COVID-19 patients with the results presented in the review on IMV (2016), one may conclude that IMV had no therapeutic value among patients with ARDS caused by SARS-CoV-2. The lack of a therapeutic effect of IMV was explained by systemic endotheliitis and coagulopathy which led to micro and macro-thromboses in various organs including the lungs.[95] Nevertheless, IMV is still in use to treat COVID-19 patients with ARDS.

From the outset of the COVID-19 pandemic, it was known that there would be a high risk group, comprising mainly of aged people with compromised immunity and comorbidities. The main parameter that could point to the risk of severe cases was lymphopenia.[93] Prognostically unfavorable signs of COVID-19 were: a decrease in the number of lymphocytes in general, a decrease in sub-populations of T-lymphocytes (CD4+, CD8+) and, as a consequence, a dysfunction of B-lymphocytes and dys-regulation of their production of Ig-M and Ig-G. The number of T-lymphocytes, including CD4+ and CD8+, was especially reduced among patients requiring treatment in the intensive care unit.[13] The severity of the case and outcome of COVID-19 largely depended on a patient's age, that correlated with a decrease in T-cells, due to the thymus atrophy.[40,96] The risk of COVID-19 hospitalization rises exponentially with age, inversely proportional to T-cell production.[41] In COVID patients, thymus enlargement was frequent and associated with increased T-lymphocytes production that appears to be a beneficial adaptation to virus-induced lymphopenia. The loss of thymic reactivation might contribute to a worse prognosis.[97] Despite great importance of immunological dysregulation caused by T-cell deficiency, there were only a few studies with application of thymus derived medicines,[42,61,98] although the immune-modulating and protective effect of thymus extract has already been known for more than two hundred years.[99]

On June 16, 2020, Professor Peter Horby said, that dexamethasone "is the only drug so far that has been shown to reduce mortality – and it reduces it significantly".[100] It reduced deaths by one-third in patients receiving invasive mechanical ventilation, by one-fifth in patients receiving oxygen without invasive mechanical ventilation, but did not reduce mortality in patients not receiving respiratory support at randomization.[101] The later conclusion on the efficacy of corticosteroids was pessimistic: "There is no evidence that corticosteroids are safe and effective on the treatment of severe acute respiratory infection when COVID-19 disease is suspected".[102] The key point of these controversial claims was a wrong approach to use corticosteroids on patients with COVID-19. The corticosteroids should be recommended as a replacement therapy to the patients with bacterial or viral infectious disease being in the phase of exhaustion according to the general adaptation syndrome described by Hans Selye.[31-32,45] (Fig. 5.c) Thus, blood tests on cortisol and aldosterone must be obligatory routine analyses before prescription of corticosteroids therapy, especially in the case of COVID-19.

1.8. Case fatality ratio and infection fatality ratio

There are two most important characteristics of infectious diseases: the first is a case fatality ratio (CFR) and the second, an infection fatality ratio (IFR). Case fatality ratio is the proportion between the number of patients who died from COVID-19 and the number of confirmed cases of COVID-19, while infection fatality ratio is the proportion between the number of patients who died from COVID-19 and the number of estimated cases infected with SARS-CoV-19.[103]

To identify the total number of infection prevalence, tests were carried out for the presence of the viral genome – Polymerase chain reaction (PCR), or for specific antibodies against SARS-CoV-2 virus (IgM and IgG). Due to the fact that PCR provided positive results for a limited time after infection, and specific antibodies were produced and circulated in the blood of an infected person from several months up to a year,[104-105] the percentage of seroprevalence would always be lower than the real one, and, therefore, IFR from COVID-19 would be always overestimated.

In a study published by J. Ioannidis (2020), at the end of October 2020, the number of infected people worldwide reached 10%.[106] Similar proportion of infected people in October 2020 was calculated for Belgium, Brazil, and the United States.[107] In December 2020, the number of infected people in the United States was estimated at 50 million, or around 15%.[108]

On January 29, 2021, the Mayor of Moscow, Sergei Sobyanin announced that "half of Moscow's 12 million residents have had Covid-19" and recovered.[109] That estimation was based on a trial where antibodies to the SARS-CoV-2 virus were found in more than half of the blood samples taken randomly from a thousand *healthy* residents of Moscow.[110]

Thus, one may conclude that since the beginning of the pandemic, major populations of large cities have already been infected with SARS-CoV-2 and have some amount of circulated antibodies or have memory about this virus stored in the T-cells.[111-113]

1.9. Databases were collected from Worldometer website

Information on cumulative numbers of the total cases and deaths due to COVID-19 is available at the Worldometer website from January 21, 2020.[18] (Fig. 6) On January 23, 2020, a controversial article on RT-PCR tests was published,[114] and a historical session of the World Economic Forum devoted to Wuhan Coronavirus took place in Davos.[115] Despite the fact that there was no cause for alarm yet,[116] January 23, 2020 was chosen as the first day of the current study.[*]

To provide an overall and detailed analysis of the COVID-19 pandemic, one year and a half was divided into three phases: (23.01.20-22.07.20), (23.07.20-22.01.21) and (23.01.21-22.07.21). Twenty three sets of databases, dated the 22nd of each month from January 2020 to November 2021, were collected. Raw data included more than 20,000 figures in total. Only simple calculations using MS Excel easily understandable by any doctor have been used.

The databases related to each month for every country were calculated by subtracting the previous month's data from the analyzed month's data. For example, in China on 22.02.20 there were 76,923 cases, and 2,441 deaths, and on 22.01.20 there were 571 cases and 17 deaths. Subtracting the second from the first, one gets that from 23.01.20 to 22.02.20 there were 76,352 cases and 2,424 deaths, and so on. The same method was used to count the database related to each phase for every country. Since only 213 countries[†] were affected by COVID-19 during the first phase, these 213 countries were analyzed during the current study.

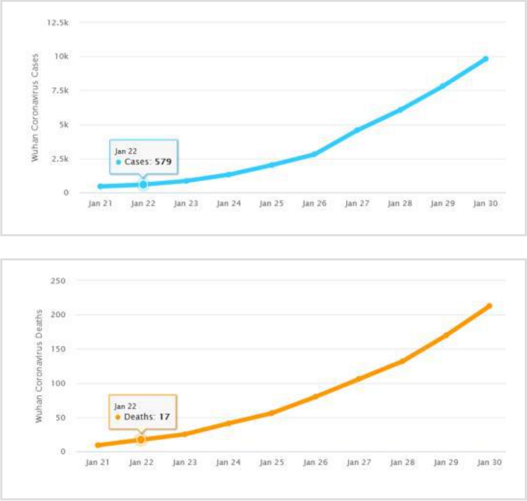

Figure 6. Cumulative numbers of the total cases of COVID-19, and the total deaths due to COVID-19 started on January 21, 2020; daily counts of both parameters have been available since January 22, 2020. [A part of the screenshot of the Worldometer website dated January 31, 2020, 21:35 GM].

2. One and a half years of the pandemic: Case fatality ratio and infection fatality ratio

Objective

To evaluate CFR and IFR in 213 countries during one and a half years of COVID-19 pandemic.

2.1. Calculation of CFR among COVID-19 patients in 213 countries

Material and Methods

To calculate the CFR and IFR worldwide, the databases of 220 countries dated as July 22, 2021, 23:49 GMT, were collected at the Worldometer website. In these countries there were 193,349,043 confirmed cases of COVID-19; 4,150,541 deaths due to COVID-19; and a total population of 7,838,783,871 people.

Since in the first phase of COVID-19 pandemic (23.01.20-22.07.20) only 213 countries were affected, so databases of only these 213 countries were used for this study. Seven countries, including Marshall Islands, Micronesia, Saint Helena, Samoa, Solomon Islands, Vanuatu, and Wallis and Futuna, with 479 confirmed cases, 8 deaths, and population of 1,412,031 people were excluded from the study. In 213 countries there were 193,348,564 cases and 4,150,526 deaths.

A case fatality ratio was calculated by dividing the number of deaths by the number of confirmed cases.

Results

The overall case fatality ratio for 213 countries, counted by dividing the number of deaths (n=4,150,526) by the number of confirmed cases (n=193,348,564), was 2.147 %. The overall case fatality ratio for 220 countries was 2.147 % too.

2.2. Calculation of CFR among COVID-19 patients in 175 countries

Material and Methods

To increase the homogeneity of the main group of study, 38 countries with death numbers of fewer than 50 were excluded from further analysis. Thus, the main group of study decreased to 175 countries, with a total population of 7,734,426,580 people. These countries had 193,207,132 confirmed cases and 4,149,944 fatal cases. For each country, the CFR was calculated by dividing the number of deaths by the number of confirmed cases.

Results

The overall case fatality ratio for 175 countries was 2.148 %. In this group the CFR ranged from 0.267 % in Qatar to 19.597 % in Yemen, and the average value of CFR was 2.146±1.965%. Based on the calculated CFR values, all countries were divided into 16 groups as shown in Fig. 7.

The first group (n=7) where CFR was less than 0.500 %, included Qatar (0.267%), Maldives (0.285%), UAE (0.286%), Cyprus (0.418%), Seychelles (0.490%), Mongolia (0.495%), and Vietnam (0.498%).

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[*] On January 23, 2020, Dr. Peter Salama, an expert in epidemiology, the former director of WHO's Health Emergencies Program, who organized a successful battle against the Ebola virus in the D.R.C., died suddenly.[117]

[†] Here and below 'Countries' means 'Countries and Territories'.

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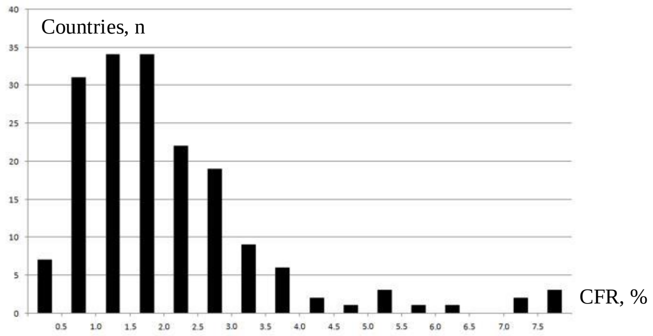

Figure 7. Distribution of 175 countries into 16 groups according to a CFR value
16 groups are: 1) CFR < 0.5%, n=7; 2) 0.5-1.0%, n=31; 3) 1.0-1.5%, n=34; 4) 1.5-2.0%, n=34; 5) 2.0-2.5%, n=22; 6) 2.5-3.0%, n=19; 7) 3.0-3.5%, n=9; 8) 3.5-4.0%, n=6; 9) 4.0-4.5%, n=2; 10) 4.5-5.0%, n=1; 11) 5.0-5.5%, n=3; 12) 5.5-6.0%, n=1; 13) 6.0-6.5%, n=1; 14) 6.5-7.0%, n=0; 15) 7.0-7.5%, n=2; 16) CFR>7.5%, n=3.

The groups # 9-16, where CFR exceeded 4.00 %, included 13 countries: Bulgaria (4.296%), Afghanistan (4.432%), Bosnia and Herzegovina (4.710%), China (5.017%), Taiwan (5.042%), Somalia (5.151%), Egypt (5.801%), Ecuador (6.415%), Syria (7.370%), Sudan (7.475%), Mexico (8.807%), Peru (9.316%), and Yemen (19.597%)

Conclusion

The calculations done in this section showed that in 38 out of 175 countries, CFR was less than 1.00%, in 68 countries CFR varied between 1.00% and 2.00%, and in 69 countries CFR was more than 2.00%. In 7 out of 175 countries, CFR was less than 0.50%.

2.3. Calculation of CFR among patients in 38 countries excluded from the main study

Background

As mentioned above, 38 countries were excluded from the main group of study.

Material and Methods

The group of countries excluded from the main study consisted of 8 countries without fatal cases related to COVID-19, and 30 countries where the number of fatal cases was from 1 to 49. In 30 countries with a total population of 102,945,260, there were 140,853 cases of COVID-19 and 582 deaths caused by COVID-19. For each country, a CFR was calculated.

Results

In 18 out of 30 countries CFR was less than 1.00% (including 10 with CFR < 0.50%), in 8 countries CFR was between 1.00% and 2.00%, and in the remaining 4 countries, CFR was more than 2.00%. Since there were no fatal cases due to COVID-19 in 8 countries, the CFR was less than 1.00% and less than 0.50%.

Conclusion

If the previous calculations done in section 2.2. were to be taken into account, then in 64 out of 213 countries, CFR was less than 1.00%; in 76 countries CFR varied between 1.00 and 2.00%; and in 73 countries, CFR was more than 2.00%. In 25 out of 213 countries, CFR was less than 0.50%.

2.4. Calculation of IFR among COVID-19 patients of 136 countries

Background

Before estimation of an infection fatality ratio, it was assumed that each person was tested only once, and the distribution of infected people among the entire population was equal. Therefore, the number of infected people was expected to increase in direct proportion to the increase in the number of new tests performed. The total number of infected people (IP) was derived from the number of total confirmed cases (C) divided by the total number of tests performed (T) and multiplied by the total population (P). Then, IFR was calculated by dividing the number of deaths due to COVID-19 (D) by the estimated number of people infected with the SARS-CoV-2 virus.

In the previous study[1] to estimate the number of infected people, a formula {IP=C•P/T} was used, but it was assumed that results of IFR {IFR=D/IP} would be overestimated. Further comparison of the results calculated using this formula, with the results estimated in other studies[106-108] revealed the consistency of the results with a difference of around 1.8 fold; so, a corrected formula was {IP = (C•P/T)•1.8}. The final adjusted formula used in the current study was IFR = [(D•T)/(C•P)]/1.8.

Material and Methods

After collecting the databases, countries with fewer than 50 reported cases of deaths, countries without information on the number of tests on SARS-CoV-2, and countries where the number of tests performed exceeded the total population, were excluded from the IFR study group.

The main group consisted of 136 countries with a total population of 6,864,034,602 people, 121,373,035 confirmed COVID-19 cases, 2,768,774 fatal cases related to COVID-19 and 1,370,764,127 COVID-19 tests. To calculate the number of infected people, a formula {IP=(C•P/T) •1.8} was used. To calculate infectious fatality ratio for each country a formula {IFR = [(D•T)/(C•P)]/1.8} was used.

Results

Since 121,373,035 COVID-19 cases were detected after 1,370,764,127 tests, it can be expected that if the number of tests would reach the total population (6,864,034,602), the number of infected people would increase up to 1,093,985,210. Thus, the overall IFR for 136 countries would be [(2,768,774•1,370,764,127)/(121,373,035•6,864,034,602)]/1.8 = 0.253%.

Among 136 countries analyzed, the IFR ranged from 0.003% in the Democratic Republic of Congo (the minimal value) to 2.340% in Peru (the maximal value).

Based on the estimated IFR values, all the countries analyzed were divided into 16 groups, as illustrated in Fig. 8.

The first and largest group with the lowest value of IFR (< 0.10%) included 52 countries. Some of the countries had quite large populations, for example, Pakistan (225,392,516; 0.088%), Nigeria (211,492,907; 0.008%), Bangladesh (166,414,749; 0.040%), Ethiopia (117,947,327; 0.022%), Egypt (104,359,775; 0.095%); Vietnam (98,259,748; 0.033%), etc. But other countries in this group had small populations, for example, Seychelles (98,988; 0.059%), French Polynesia (282,617; 0.039%), Réunion (902,035; 0.049%), Equatorial Guinea (1,451,181; 0.090%), etc.

The groups # 11-16 with high values of IFR (>1.00%) included 8 countries: Slovakia (1.001%), Canada (1.030%), Germany (1.065%), Chile (1.134%), Bulgaria (1.207%), Hungary (1.343%), Australia (1.425%), and Peru (2.340%).

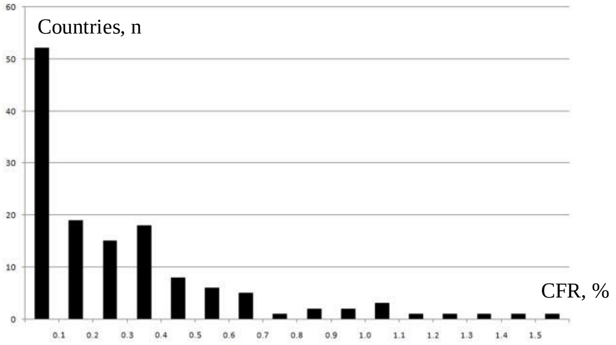

Figure 8. Distribution of 136 countries into 16 groups according to a IFR value 16 groups are: 1) IFR < 0.10%, n=52; 2) 0.10-0.20%, n=19; 3) 0.20-0.30%, n=15; 4) 0.30-0.40%, n=18; 5) 0.40-0.50%, n=8; 6) 0.50-0.60%, n=6; 7) 0.60-0.70%, n=5; 8) 0.70-0.80%, n=1; 9) 0.80-0.90%, n=2; 10) 0.90-1.00%, n=2; 11) 1.00-1.10%, n=3; 12) 1.10-1.20%, n=1; 13) 1.20-1.30%, n=1; 14) 1.30-1.40%, n=1; 15) 1.40-1.50%, n=1; 16) IFR > 1.50%, n=1.

Conclusion

The calculations done in this section showed that in 128 out of 136 countries, the IFR was below 1.00 %, in 7 countries IFR was between 1.00 and 2.00 %, and only in 1 country IFR were above 2.00 %. In 112 out of 136 countries IFR was less than 0.50 %.

2.5. Estimation of IFR in the 77 countries excluded from the main study

Background

As mentioned above, some countries were excluded from the main group of study.

Material and Methods

To estimate IFR for 52 countries, including 5 countries without information on the number of tests, and 47 countries where the number of tests performed exceeded the total population, a ratio between average CFR and average IFR in the main group of countries was calculated.

The main group (n=136) was divided into 4 subgroups: (1st) CFR was less than 1.00%, N=24; (2nd) CFR was between 1.00 and 2.00%, N=50; (3rd) CFR was between 2.00 and 3.00%, N=35; and (4th) CFR was higher than 3.00%, N=27. For each of these subgroups a ratio or a coefficient between average CFR and average IFR was counted: (1st) CFR/IFR=4.369; (2nd) CFR/IFR=5.991; (3rd) CFR/IFR=7.565; (4th) CFR/IFR=11.586. These four coefficients were used to calculate IFR in the group of 52 countries mentioned above.

In the group of countries (n=17) where the number of tests performed was higher than "0" but less than the population, and the number of deaths was less than 50, IFR was counted using the formula IFR = [(D•T)/(C•P)]/1.8, which was used in section 2.4.

Results

In 47 countries without information on the number of tests performed and 5 countries where the number of tests performed exceeded the total population (52 countries in total), the estimated IFR was less than 1.00%, including 51 countries, where IFR was less than 0.50%.

In all countries where the number of death was less than 50 (n=17), IFR was less than 1.00 %; and in 14 out of 17 countries, IFR was less than 0.50%.

In 8 countries without deaths, IFR was "0", so it was less than 1.00% and less than 0.50%.

Conclusion

The calculations done in the section 2.4 and 2.5 revealed that in 205 out of 213 countries, IFR was less than 1.00 %; in 7 countries IFR was between 1.00% and 2.00 %; and only in 1 country IFR was more than 2.00 %. In 185 out of 213 countries IFR was less than 0.50 %.

Taking into account the results of a study conducted in January, 2021, when 50 % of Moscow's city population had already antibodies against SARS-CoV-2,[109-110] one may assume that in July, 2021, the percentage of seroprevalence could be even higher and IFR could be lower than estimated in the current study.

2.6. Dynamics of the main cumulative data during 22 months of the COVID-19 pandemic

Background

The current pandemic curve has a wave-like form with a gradual increase and decrease of daily, weekly, and monthly numbers related to cases and deaths.

Material and Methods

Twenty three sets of databases, which were dated the 22nd of each month from January 2020 to November 2021, were collected. The number of total COVID-19 cases, deaths due to COVID-19, tests performed, and population were presented in Table 1. CFR, IFR as well as number of cases per 1 million (C/M) and death per 1 million (D/M) were counted for each date (Table 1). Dynamics of CFR and IFR were illustrated in Fig. 9.

Results

During 22 months of the pandemic there was an increase in the total number of cases, deaths, and tests on COVID-19 as well as population worldwide. Comparisons between numbers related to the pandemic collected on January 22, 2021 (12 months, or 1 year) and July 22, 2021 (18 months, or 1.5 years), revealed that during the six months, parameters of the pandemic were almost doubled compared to the

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similar cumulative parameters during the previous one year. The number of COVID-19 cases and deaths increased by 1.96 fold, and the number of tests increased by 2.13 fold.

The cumulative CFR was highest in April and May, 2020, followed by a decreasing trend, but the estimated cumulative IFR increased gradually (Fig. 9).

Table 1. Dynamics of the main cumulative data during 22 months of the COVID-19 pandemic

#	Date	Cases	Deaths	Tests	Population	CFR	IFR	C/M	D/M
0	22.01.20	579	17	-	-	2.936	-	-	-
1	22.02.20	78,001	2,457	-	-	3.150	-	-	-
2	22.03.20	334,886	14,603	-	-	4.361	-	-	-
3	22.04.20	2,632,559	183,879	23,282,447	-	6.985	-	-	-
4	22.05.20	5,296,813	339,374	67,673,680	7,749,928,184	6.407	0.031	683	44
5	22.06.20	9,176,001	473,406	130,810,378	7,756,390,179	5.159	0.048	1,183	61
6	**22.07.20**	**15,362,745**	**625,395**	**302,374,544**	**7,762,530,924**	**4.071**	**0.088**	**1,979**	**81**
7	22.08.20	23,358,160	807,665	409,774,283	7,768,876,378	3.458	0.101	3,007	104
8	22.09.20	31,750,352	974,050	609,767,516	7,775,221,824	3.068	0.134	4,084	125
9	22.10.20	41,959,098	1,142,057	759,449,532	7,781,362,578	2.722	0.148	5,392	147
10	22.11.20	58,947,048	1,392,963	955,296,514	7,787,708,023	2.363	0.161	7,569	179
11	22.12.20	78,280,842	1,721,802	1,164,332,290	7,793,848,775	2.200	0.183	10,044	221
12	**22.01.21**	**98,669,593**	**2,113,750**	**1,375,887,509**	**7,800,194,225**	**2.142**	**0.210**	**12,650**	**271**
13	22.02.21	112,239,378	2,484,426	1,589,416,906	7,806,539,667	2.214	0.250	14,378	318
14	22.03.21	124,265,956	2,734,688	1,805,314,644	7,812,271,038	2.201	0.283	15,907	350
15	22.04.21	145,297,992	3,083,902	2,087,974,472	7,818,616,492	2.122	0.315	18,584	394
16	22.05.21	167,027,095	3,467,994	2,378,274,484	7,825,090,334	2.076	0.350	21,345	443
17	22.06.21	179,871,406	3,896,149	2,660,800,034	7,831,231,088	2.166	0.409	22,968	498
18	**22.07.21**	**193,348,564**	**4,150,533**	**2,926,443,254**	**7,837,371,840**	**2.147**	**0.445**	**24,670**	**530**
19	22.08.21	212,552,947	4,443,846	3,218,070,808	7,843,921,989	2.010	0.477	27,098	567
20	22.09.21	230,824,305	4,731,461	3,598,394,533	7,850,062,735	2.050	0.522	29,404	603
21	22.10.21	243,676,239	4,952,263	3,889,118,661	7,856,203,486	2.032	0.559	31,017	630
22	22.11.21	258,262,254	5,172,861	4,212,580,383	7,862,548,934	2.003	0.596	32,847	658

Conclusion

During the last 6 months of the analyzed 1.5 years of the pandemic, the number of COVID-19 cases, deaths and tests was dramatically increasing. To provide a more detailed analysis of this negative trend, 1.5 years was divided into 3 phases: the 1st phase (23.01.20-22.07.20), the 2nd phase (23.07.20-22.01.21), and the 3rd phase (23.01.21-22.07.21), which are analyzed in the next section.

3. Three phases of the COVID-19 pandemic in 213 countries

Background

During six months of the 3rd phase (23.01.21-22.07.21) the number of cases, deaths and tests was almost equal to the similar ones reported during the previous one year (23.01.20-22.01.21).

Objective

To analyze and compare the dynamics of cases, deaths and tests during three phases of the pandemic.

Material and Methods

Analysis of the three phases of the COVID-19 pandemic was divided into two parts. The overall analysis in 213 countries was carried out in the first part, and a separate analysis of each country, – in the second part.

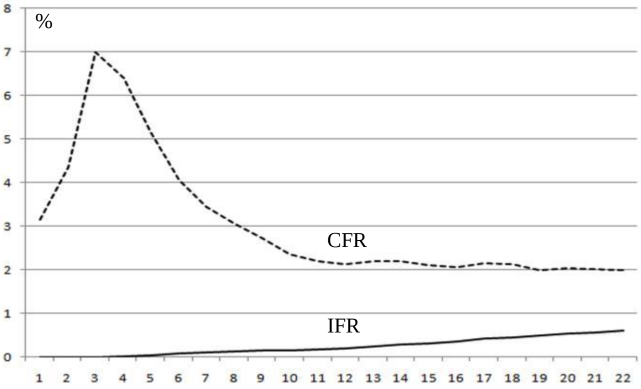

Figure 9. Dynamics of CFR and IFR during 22 months of the COVID-19 pandemic

3.1. Overall analysis of the three phases of the COVID-19 pandemic in 213 countries

Material and Methods

Four databases, dated 22.01.20, 22.07.20, 22.01.21 and 22.07.21 were collected from the Worldometer website. The number of cases, deaths, and tests related to each phase for each of the 213 countries was calculated by subtracting the previous phase's data from the analyzed phase's data. For example, on 22.01.21 there were 98,669,593 cases, 2,113,750 deaths, and 1,375,887,509 tests; and on 22.07.21 there were

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193,348,564 cases, 4,150,533 deaths, and 2,926,443,254 tests. Subtracting the first numbers (dated 22.01.21) from the second (dated 22.07.21), one concludes that during 6 months, from 23.01.21 to 22.07.21 there were 94,678,971 new cases, 2,036,783 new deaths, and 1,550,555,745 new tests, etc. CFR for each phase was calculated.

Ratios between cases, deaths and tests recorded during the 1st, 2nd and 3rd phases in relation to the similar parameters recorded during the whole 1.5 years were also counted. Additionally, a calculation of ratios between cases, deaths and tests recorded during 12 months of the first year of the pandemic in relation to the similar parameters recorded during the whole 1.5 years was also carried out. (Table 2).

Results

According to the calculations done, the 3rd phase was characterized by a dramatic increase for all parameters of the pandemic, including cases, deaths, and tests. The most intensive growing parameter was tests conducted to reveal new suspicious cases of COVID-19.

The case fatality ratio was the highest in the 1st phase, then decreased in the 2nd phase and again increased in the 3rd phase.

Table 2. Number of cases, deaths and tests related to 6 months of various phases, and also the same numbers recorded during the first 12 months (phases I+II, 1 year) and the whole period of 18 months (phases I+II+III, 1.5 years).

Phase, #	Date	Cases	%	Deaths	%	Tests	%	CFR,%
I	23.01.20-22.07.20	15,362,166	7.94	625,378	15.07	302,374,544	10.33	4.071
II	23.07.20-22.01.21	83,306,848	43.09	1,488,355	35.86	1,073,512,965	36.68	1.787
III	23.01.21-22.07.21	94,678,971	48.97	2,036,783	49.07	1,550,555,745	52.99	2.151
I+II+III	**23.01.20-22.07.21**	**193,348,564**	**100.0**	**4,150,533**	**100.0**	**2,926,443,254**	**100.0**	**2.147**
I+II	23.01.20-22.01.21	98,669,014	51.03	2,113,733	50.93	1,375,887,509	47.01	2.142
III	23.01.21-22.07.21	94,678,971	48.97	2,036,783	49.07	1,550,555,745	52.99	2.151
I+II+III	**23.01.20-22.07.21**	**193,348,564**	**100.0**	**4,150,533**	**100.0**	**2,926,443,254**	**100.0**	**2.147**

3.2. Analysis of the three phases of the COVID-19 pandemic for each of the 213 countries

Material and Methods

Four databases for each country, dated 22.01.20, 22.07.20, 22.01.21 and 22.07.21 were collected from the Worldometer website.

The number of cases, deaths, and tests related to each phase for every country was calculated by subtracting the previous phase's data from the analyzed phase's data. For example, in Malaysia, on 22.07.20 there were 123 deaths; on 22.01.21 there were 660 deaths, and on 22.07.21 there were 7,574 deaths in total. (Fig. 10). Subtracting 660 from 7,574, and 123 from 660, one concludes that during 6 months, from 23.01.21 to 22.07.21 there were 6,914 new deaths, and from 23.07.20 to 22.01.21, there were 537 deaths. A CFR was calculated for each country for every phase.

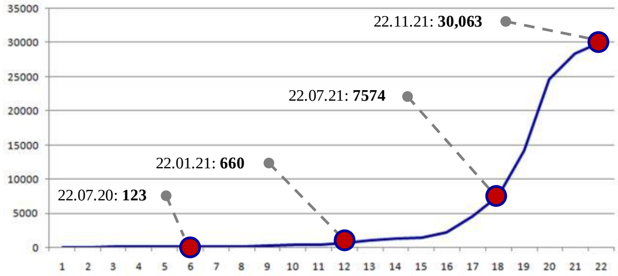

Figure 10. Dynamics of cumulative number of deaths in Malaysia.
The vertical axis shows number of deaths;
the horizontal axis shows number of a month.

Then a comparison between the number of cases, deaths, and tests recorded during the 3rd phase of the pandemic (23.01.21-22.07.21) and the number of similar parameters recorded during 1.5 years (23.01.20-22.07.21) was carried out for each country.

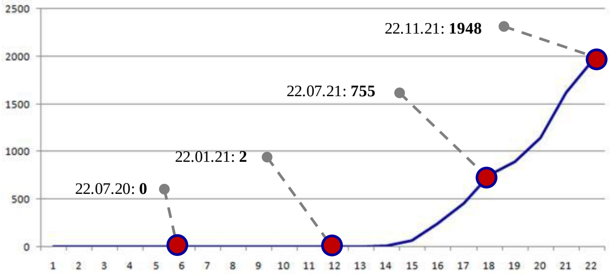

Figure 11. Dynamics of cumulative number of deaths in Mongolia.
The vertical axis shows number of deaths;
the horizontal axis shows number of a month.

For example, in Mongolia, at the end of the 2nd phase or one year of the pandemic (22.01.21), there were 2 deaths only; but at the end of the 3rd phase or 1.5 years of the pandemic (22.07.21), there were 755 deaths in total. (Fig. 11). After subtracting the first figure from the second, one can conclude that during 6 months of the 3rd phase of the pandemic there were 753 new deaths in Mongolia. If the a number of deaths for the 3rd phase (n=753) is divided by the number of deaths for 1.5 years of the pandemic (n=755), it can be concluded that during the 1.5 years of the pandemic, 99.74% of deaths due to COVID-19 in Mongolia took place during the 3rd phase of the COVID-19 pandemic.

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Table 3. (a) Distribution of countries according to CFR, and (b) average CFR during each phase of the COVID-19 pandemic

(a)							(b)	
		CFR, %					**Average CFR**, % in countries with fatal cases	
Phase	N	**> 2.0**	**1.0-2.0**	**< 1.0**	Including			
					< 0.50	0.00	Average CFR	Countries, N
I	213	110	39	64	41	28	3.597 ± 3.732	185
II	213	61	61	91	49	19	1.863 ± 2.616	194
III	213	68	72	73	37	16	2.025 ± 2.098	197

Results

Based on the CFR calculated for each phase, the 213 countries were divided into 3 groups (Table 3/a). A group of countries where CFR was less than 1.00% included countries with CFR less than 0.50% and with CFR=0.00%. An average CFR for each phase was calculated for countries (N) where fatal cases were recorded (Table 3/b).

Based on the comparison between numbers related to the 3rd phase and the whole period of 1.5 years, all the countries were divided into 6 groups (Table 4). If the ratio between numbers recorded during the 3rd phase and the numbers recorded during the whole 1.5 years of the pandemic is higher than 33.33 %, it means the number of cases, or deaths or tests recorded during the 3rd phase was higher than the average number for each of the three phases. If this ratio is higher than 50.00 %, it means that the vast majority of cases, or deaths or tests took place during the 3rd phase of the pandemic. The higher the percentage, the more cases, deaths or tests took place during the 3rd phase.

Table 4. Distribution of countries into six groups where more than one third of cases, deaths and tests took place during the 3rd phase of the COVID-19 pandemic

	Six groups of countries according to the ratio between the number of cases, deaths and tests recorded in the 3rd phase and the similar numbers recorded during 1.5 years.						Total number of countries (%) where ratio was more than 33.33%
	33.33-50 %	**50-60 %**	**60-70 %**	**70-80 %**	**80-90 %**	**90-100 %**	
Cases	71	43	29	15	8	14	**180** (84.51 %)
Deaths	50	43	19	14	14	17	**157** (73.71 %)
Tests	52	67	34	19	9	12	**193** (90.61 %)

A list of the countries where the vast majority (80-100%) of COVID-19 cases or deaths, or tests took place during the 3rd phase of the pandemic is presented in small font below.

Cases [80-90 %, n=8]: Anguilla, Antigua and Barbuda, Isle of Man, Malaysia, Maldives, Mauritius, Saint Lucia, and Sri Lanka; [90-100%, n=14]: British Virgin Islands, Cambodia, Cuba, Fiji, Laos, Mongolia, Papua New Guinea, Saint Kitts and Nevis, Seychelles, Taiwan, Thailand, Timor-Leste, Uruguay, and Vietnam.

Deaths [80-90 %, n=14]: Antigua and Barbuda, Barbados, Caribbean Netherlands, Curaçao, Eritrea, Namibia, Paraguay, Réunion, Saint Lucia, Somalia, St. Vincent Grenadines, Trinidad and Tobago, Uganda, Zambia; [90-100 %, n=17]: Botswana, British Virgin Islands, Cambodia, Cuba, Laos, Malaysia, Mongolia, Fiji, Papua New Guinea, Saint Kitts and Nevis; Seychelles, Sri Lanka, Taiwan, Thailand, Timor-Leste, Uruguay, and Vietnam.

Tests: [80-90 %, n=9]; Cyprus, Vietnam, Yemen, Turks and Caicos, Thailand, Denmark, Czechia, Timor-Leste, British Virgin Islands; [90-100 %, n=12]: Algeria, Austria, Burkina, Cameroon, Chad, DRC, Faso, Fiji, Sierra Leone, Somalia, Sudan, Syria; Taiwan.

Conclusion

Calculations done in this section have revealed that in most countries, the main number of cases, deaths and tests were recorded during the 3rd phase of the pandemic.

4. Twenty Two Months of the COVID-19 pandemic: Dynamics of cases, deaths, tests and CFR

Objective

To evaluate dynamics of monthly number of cases, deaths, and tests worldwide during 22 months of the COVID-19 pandemic, and to identify countries with the most dramatic tendency.

4.1. Twenty two months of the COVID-19 pandemic: Overall cases, deaths, tests and CFR worldwide

Objective

To evaluate dynamics of monthly numbers of cases, deaths, tests and CFR worldwide during 22 months of the COVID-19 pandemic

Material and Methods

Twenty three sets of databases, dated the 22nd of each month from January 2020 to November 2021, for 213 countries were collected. The databases related to each month for every country were calculated by subtracting the previous month's data from the analyzed month's data. The

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number of cases, deaths, tests as well as monthly ratios between cases and tests (C/T), deaths and tests (D/T), CFR, cases per 1 million (C/M) and deaths per 1 million (D/M) for all 213 countries together were counted and presented in Table 5. Monthly number of tests, cases, deaths illustrated in Figures 12-14.

Table 5. Monthly cases, deaths, and tests during 22 months of the COVID-19 pandemic worldwide. There are also ratios between number of cases and tests (C/T), number of deaths and tests (D/T), as well as CFR. The highest numbers in the column are highlighted in bold.

M,#	Date	Cases	Deaths	Tests	CFR	C/T	D/T	C/M	D/M
0	before 22.01.20	579	17	-	2.936	-	-	-	-
1	23.01.20 - 22.02.20	77,422	2,440	-	3.152	-	-	-	-
2	23.02.20 - 22.03.20	256,885	12,146	-	4.728	-	-	-	-
3	23.03.20 - 22.04.20	2,297,673	169,276	23,282,447	**7.367**	**9.869**	**0.727**	-	-
4	23.04.20 - 22.05.20	2,664,254	155,495	44,391,233	5.836	6.002	0.350	344	20
5	23.05.20 - 22.06.20	3,879,188	134,032	63,136,698	3.455	6.144	0.212	500	17
6	23.06.20 - 22.07.20	6,186,744	151,989	171,564,166	2.457	3.606	0.089	797	20
7	23.07.20 - 22.08.20	7,995,415	182,270	107,399,739	2.280	7.445	0.170	1,029	23
8	23.08.20 - 22.09.20	8,392,192	166,385	199,993,233	1.983	4.196	0.083	1,079	21
9	23.09.20 - 22.10.20	10,208,746	168,007	149,682,016	1.646	6.820	0.112	1,312	22
10	23.10.20 - 22.11.20	16,987,950	250,906	195,846,982	1.477	8.674	0.128	2,181	32
11	23.11.20 - 22.12.20	19,333,794	328,839	209,035,776	1.701	9.249	0.157	2,481	42
12	23.12.20 - 22.01.21	**20,388,751**	**391,948**	211,555,219	1.922	**9.638**	**0.185**	**2,614**	**50**
13	23.01.21 - 22.02.21	13,569,785	370,676	213,529,397	2.732	6.355	0.174	1,738	47
14	23.02.21 - 22.03.21	12,026,578	250,262	215,897,738	2.081	5.571	0.116	1,539	32
15	23.03.21 - 22.04.21	21,032,036	349,214	282,659,828	1.660	7.441	0.124	**2,690**	45
16	23.04.21 - 22.05.21	**21,729,103**	384,092	290,300,012	1.768	7.485	0.132	2,777	49
17	23.05.21 - 22.06.21	12,844,311	**428,155**	282,525,550	**3.333**	4.546	0.152	1,640	**55**
18	23.06.21 - 22.07.21	13,477,158	254,384	265,643,220	1.888	5.073	0.096	1,720	32
19	23.07.21 - 22.08.21	19,204,383	293,313	291,627,554	1.527	6.585	0.101	2,448	37
20	23.08.21 - 22.09.21	18,271,358	287,615	**380,323,725**	1.574	4.804	0.076	2,328	37
21	23.09.21 - 22.10.21	12,851,934	220,802	290,724,128	1.718	4.421	0.076	1,636	28
22	23.10.21 - 22.11.21	14,586,015	220,598	**323,461,722**	1.512	4.509	0.068	1,855	28

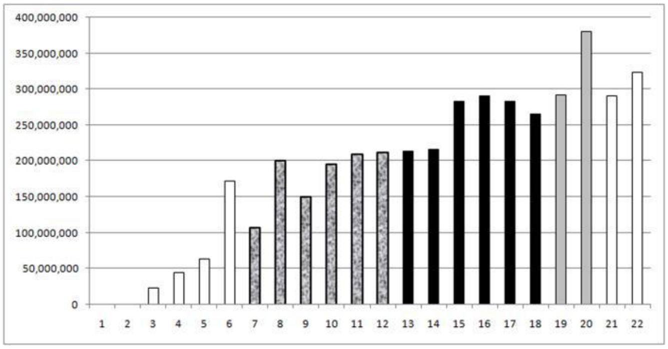

Figure 12. Monthly number of tests. The vertical axis shows number of tests; the horizontal axis shows number of a month. The 1st phase includes months # 1-6 (white columns); the 2nd phase includes months # 7-12 (grey-white columns); the 3rd phase includes months # 13-18 (black columns); months # 19-20th (grey columns); months # 21-22nd (white columns).

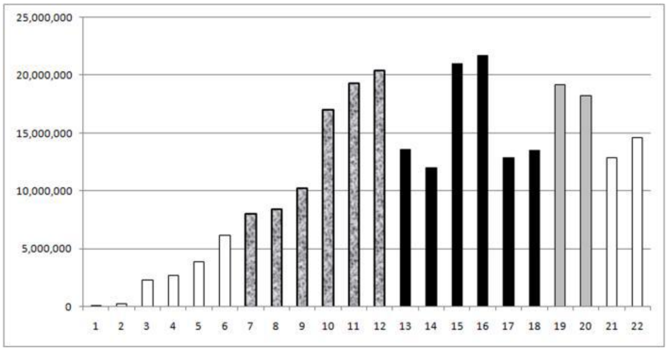

Figure 13. Monthly number of cases. The vertical axis shows number of cases; the horizontal axis shows number of a month. The 1st phase includes months # 1-6 (white columns); the 2nd phase includes months # 7-12 (grey-white columns); the 3rd phase includes months # 13-18 (black columns); months # 19-20th (grey columns); months # 21-22nd (white columns).

Results

During 22 months of the pandemic, the monthly number of tests increased almost gradually from 23,282,447 in the 3rd month, up to 380,323,725 in the 20th month (Fig. 12). The monthly number of cases varied from 77,422 in the first month up to 21,729,103 in the 16th month; there are three peaks, in the 11-12th, 15-16th and 19-20th months (Fig. 13). The monthly number of deaths varied from 2,440 in the first month up to 428,155 in the 17th month; there are two peaks, in the 12th month and in the 17th month (Fig. 14).

The highest monthly CFR (7.367) and the highest monthly ratio between cases and tests (9.869), as well as deaths and tests (0.727) were in the 3rd month (23.03.20-22.04.20) of the pandemic. Since March 11, 2020 the highest weekly CFR (8.507%) was estimated for the week April 12-18, 2020, and the highest daily CFR (9.514%) was estimated for April 17, 2020.[1]

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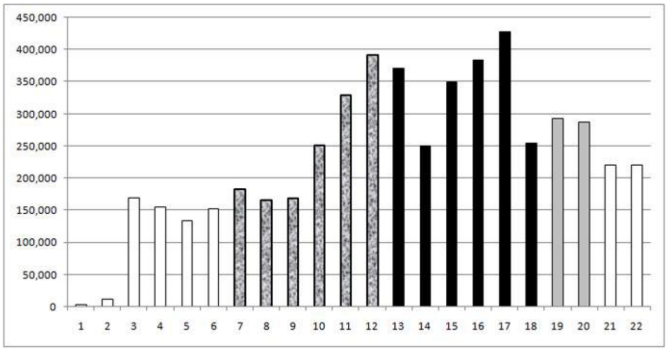

Figure 14. Monthly number of deaths. The vertical axis shows number of deaths; the horizontal axis shows number of a month. The 1st phase includes months # 1-6 (white columns); the 2nd phase includes months # 7-12 (grey-white columns); the 3rd phase includes months # 13-18 (black columns); months # 19-20th (grey columns); months # 21-22nd (white columns).

4.2. Evolution of the COVID-19 pandemic before and after the end of the 3rd Phase

Background

During 1.5 years of the pandemic, in the majority of the countries analyzed, number of COVID-19 cases, deaths and tests were highest during the 3rd phase.

Objective

To analyze the evolution of COVID-19 pandemic before and after the end of the 3rd phase

Material and Methods

Three databases for each country, dated 22.05.21, 22.07.21, and 22.09.21 were collected from the Worldometer website. Then, for each country, the cases, deaths and tests were calculated for 2 periods of time: (1st) 23.05.21-22.07.21 and (2nd) 23.07.21-22.09.21.

The trend of the pandemic was analyzed by dividing the numbers recorded during the 2nd period by the numbers recorded during the 1st period, accordingly. If the ratio is more than 1, i.e. more than 100 %, it means that after the end of the 3rd phase, there is still an upward trend in the number of COVID-19 cases, deaths, or tests in a certain country.

For example, in the United Kingdom, there were 127,716 total deaths on 22.05.21; 128,980 on 22.07.21, and 135,621 – on 22.09.21. (Fig. 15) Hence, there were 6,641 new deaths recorded during the 2nd period (23.07.21-22.09.21) and 1,264 new deaths recorded during the 1st period of time (23.05.21-22.07.21). Dividing 6,641 by 1,264 resulted in 5.225. That means, the number of deaths during the second period was more than five times higher than the number of deaths during the 1st period. Thus, in the United Kingdom there was a trend pointing to a dramatic increase in the number of deaths, etc.

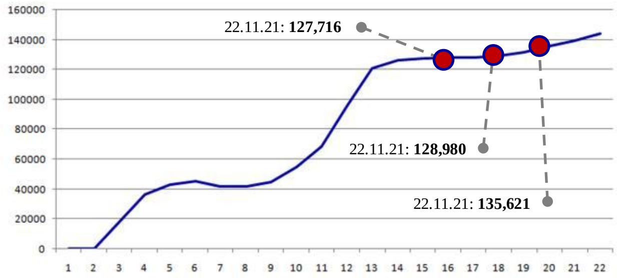

Figure 15. Dynamics of cumulative number of deaths in the United Kingdom. The vertical axis shows number of deaths; the horizontal axis shows number of a month.

Results

A comparison of the main parameters of the pandemic between the 2nd and 1st period of time for each country revealed that in the majority of them, there was an upward trend pointing to an increase in cases (n=158; 74.178%), deaths (n=133; 62.441%) and tests (n=125; 58.685%). Table 6.

Conclusion

A group of countries with a dramatic increase in COVID-19 cases, deaths, and tests during the 2nd period of time (23.07.21-22.09.21), in comparison with the 1st period 23.05.21-22.07.21), was revealed. In some of countries the difference between analyzed parameters exceeded 5-10 times, or even more. In three of them (Guadeloupe, Israel, Vietnam) there was a dramatic increase in all parameters including cases, deaths and tests.

Table 6. Results of a comparison between the number of cases, deaths and tests recorded in the databases of 213 countries during the 2nd (23.07.21-22.09.21) and the 1st (23.05.21-22.07.21) period of time.

#	**Decrease / Increase**	**Cases**		**Deaths**		**Tests**	
		N	%	N	%	N	%
1	Decrease (< 100%)	53	24.88	65	30.52	69	32.39
2	No change	2	0.94	15	7.04	19	8.92
3	Increase (> 100%)	158	74.18	133	62.44	125	58.69
	including:						
	from 0 to 1+n	4	01.88	16	07.51	3	01.41
	+ 100 – 200 %	46	21.60	38	17.84	91	42.72
	+ 200 - 500 %	54	25.35	46	21.60	24	11.27
	+ > 500 %	54	25.35	33	15.49	7	03.29
	Total	**213**	**100**	**213**	**100**	**213**	**100**

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A list of countries with a dramatic increase in COVID-19 cases, deaths, and tests between 23.07.21 and 22.09.21, is presented in small font below:

Increase in Cases [500-1000%; n=29]: Yemen, Austria, Estonia, Guinea-Bissau, Japan, USA, Ethiopia, Mauritius, Equatorial Guinea, Martinique, Laos, Burundi, Palestine, Morocco, Togo, Turks and Caicos, Moldova, Barbados, New Zealand, Eswatini, Somalia, Nigeria, Jamaica, Singapore, Greenland, Vietnam, Saint Lucia, Bulgaria, Sao Tome and Principe; [1000-2000%; n=8]: Bosnia and Herzegovina, Aruba, Montserrat, Romania, Iceland, Montenegro, Serbia, Azerbaijan; [>2000%; n=16]: Israel, Australia, San Marino, Guadeloupe, CAR, North Macedonia, Bermuda, Albania, Anguilla, French Polynesia, Antigua and Barbuda, Benin, Brunei, Dominica, New Caledonia, Grenada.

Increase in Deaths [by 500-1000%; n=17] Togo, the United Kingdom, North Macedonia, Kazakhstan, Timor-Leste, Libya, Benin, Belize, Curaçao, Singapore, Saint Lucia, Eswatini, Nigeria, Azerbaijan, Gambia, Guinea-Bissau, Ghana; [1000-2000%; n=8] Bermuda, Albania, Ivory Coast, Barbados, Morocco, Malta, Burundi, Israel; [>2000%; n=8] Mauritius, Somalia, Aruba, Guadeloupe, Vietnam, Australia, Martinique, French Polynesia.

Increase in Tests [by 300-500%; n=5] Israel, Vietnam, South Sudan, Falkland Islands, Guadeloupe; [>500%; n=7] Saint Pierre Miquelon, Brunei, Bhutan, Dominica, Timor-Leste, Thailand, Réunion.

4.3. Comparison of the average monthly number of cases, deaths and tests in each of the 213 countries related to the months # 21-22 (23.09.21-22.11.21) and to the previous two months # 19-20 (23.07.21-22.09.21).

Objective

To evaluate the dynamics of the monthly number of cases, deaths and tests in each of the 213 countries during the months # 19-22 of the COVID-19 pandemic, and to identify countries with a negative trend.

Material and Methods

The average number of monthly cases, deaths and tests were counted for two months # 21-22 (23.09.21-22.11.21) and for the previous two months # 19-20 (23.07.21-22.09.21). Then a comparison of these parameters was done by dividing the numbers related to the months # 21-22 by the numbers related to the previous two months # 19-20. If the ratio was more than 1, i.e. more than 100 %, it means that in a certain country, there was a trend pointing to an increase in COVID-19 cases, deaths, or tests. If the ratio was less than one (<100%), it means that the parameters of the pandemic had a downward trend - to decrease. Results are presented in Table 7.

Results

Despite the majority of countries analyzed showing lower average monthly number of cases, deaths, and tests in the last two months (# 21-22), compared with the same parameters recorded during the previous two months (# 19-20), there was a group of countries where the average monthly cases and deaths during the latest months were at least 5 times higher than during the previous two months; and the monthly number of tests during the latest months was at least 2 times higher than during the previous two months. The following list in small font included only countries with a total population of more than 3,000,000 people.

Increase in Cases [>500%; n=11] Cameroon (526%), Croatia (536%), Romania (713%), Ukraine (844%), Singapore (973%), Papua New Guinea (1033%), Slovakia (1643%), Czechia (2037%), Hungary (2066%), Poland (2537%), Tanzania (2897%).

Increase in Deaths [>500%; n=19] Egypt (504%), Austria (546%), Moldova (565%), Croatia (625%), Niger (643%), Congo (987%), Cameroon (1058%), Laos (1064%), Ukraine (1115%), Romania (1214%), Burkina Faso (1271%), New Zealand (1300%), Papua New Guinea (1370%), Czechia (1744%), Poland (1817%), Singapore (1856%), Tanzania (2334%), Slovakia (2418%), Hungary (2463%).

Increase in Tests [>200%; n=8] Slovenia (213%), Israel (219%), Greece (219%), Ukraine (226%), Hungary (235%), Germany (256%), Brazil (260%), Thailand (533%).

Conclusion

A comparison of the data related to the months # 21-22 and to the previous two months # 19-20 revealed a trend showing a decrease in the number of cases, deaths and tests. Nevertheless, there emerged a group of countries where the main parameters of the pandemic still had a tendency to increase.

Table 7. Results of a comparison between the average monthly number of cases, deaths and tests recorded during two months # 21-22 (23.09.21-22.11.21) and during the previous two months # 19-20 (23.07.21-22.09.21).

#	**Decrease / Increase**	**Cases**		**Deaths**		**Tests**	
		N	%	N	%	N	**%**
1	Decrease (< 100%)	129	60.56	108	50.70	124	58.22
2	No change	2	0.94	10	4.70	25	11.74
3	Increase (> 100%)	82	38.50	95	44.60	64	30.04
	including:						
	from 0 to 1+n	0	00.00	5	02.35	3	01.41
	+ 100 – 200 %	32	15.03	29	13.62	51	23.94
	+ 200 - 500 %	35	16.43	33	15.49	8	03.75
	+ > 500 %	15	07.04	28	13.14	2	00.94
	Total	**213**	**100**	**213**	**100**	**213**	**100**

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4.4. Comparison of the average monthly number of cases, deaths and tests in each of the 213 countries related to the latest month analyzed # 22 (23.10.21-22.11.21) and the previous month # 21 (23.09.21-22.10.21)

Objective

To evaluate the dynamics of the monthly number of cases, deaths and tests in each of the 213 countries during the months # 21-22, and to identify countries with a negative tendency.

Material and Methods

The number of monthly cases, deaths and tests for the months # 22 (23.10.21- 22.11.21) and # 21 (23.09.21-22.10.21) was counted in the same manner as in the previous sections. A comparison between two months was done by dividing the numbers related to month # 22nd by the numbers related to the month # 21st. If the ratio is more than 1, i.e. more than 100 %, there is still an upward trend in the number of COVID-19 cases, deaths, or tests in a certain country. If the ratio is less than one (<100%), it means parameters of the pandemic had a tendency to decrease. Results are presented in Table 8.

Results

A comparison of the data related to the month # 22 with the data related to the previous month (# 21) revealed a trend showing a decrease in number of cases, deaths and tests. Nevertheless, there are groups of countries where the monthly numbers of cases and deaths during the month # 22 was at least 5 times higher than during the previous month # 21; and the monthly number of tests during the month # 22 was at least 2 times higher than during the previous month # 21. The following list in small font included only countries with a total population of more than 3,000,000 people.

Increase in Cases [>500%; n=3] Poland (638%), Czechia (803%), Hungary (733%).

Increase in Deaths [>500%; n=5 Poland (535%), Hungary (768%), Niger (800%), Czechia (1075), New Zealand (1200%).

Increase in Tests [>200%; n=7] Nigeria (204%), Iran (211%), Hungary (220%), Haiti (250%), Argentina (236%), Germany (290%), Denmark (308%).

Conclusion

The study done in this section has revealed that during the months # 21-22 in the majority of countries analyzed, the number of new COVID-19 cases, deaths and tests had shown a tendency to decrease. This is an objective basis for optimism and inspires hope for an end to the pandemic.

Table 8. Results of a comparison between the monthly number of cases, deaths and tests recorded during the month # 22 (23.10.21-22.11.21) and the previous month # 21 (23.09.21-22.10.21)

#	**Decrease / Increase**	**Cases**		**Deaths**		**Tests**	
		N	%	N	%	N	**%**
1	Decrease (< 100%)	118	55.40	117	54.93	96	45.07
2	No change	6	2.82	16	7.51	40	18.78
3	Increase (> 100%)	89	41.78	80	37.56	77	36.15
	including:						
	from 0 to 1+n	0	00	10	04.69	9	04.23
	+ 100 – 200 %	48	22.53	49	23.01	57	26.76
	+ 200 - 500 %	35	16.43	16	07.51	10	04.69
	+ > 500 %	6	02.82	5	02.35	1	00.47
	Total	**213**	**100**	**213**	**100**	**213**	**100**

5. Discussion

An analysis of the main epidemiological parameters worldwide has resulted in distinguishing three phases of the pandemic worldwide: these phases are different in terms of the number of new tests, cases and deaths, and they have their own features in each country.

The first phase (23.01.20-22.07.20) began with new cases and first victims of COVID-19 identified outside China. During the first phase, diagnostic tests to detect SARS-CoV-2 were used mainly on people with symptoms and their immediate contacts. Clinical trials of potentially effective drugs were in the initial phase, and invasive mechanical ventilation, which had no therapeutic effect on patients with COVID-19, was used very actively. Since protocols of treatment were not developed yet, and the number of confirmed cases was small, the CFR value was the highest in the history of the pandemic.

During the second phase (23.07.20-22.01.21) clinical trials were completed and doctors received effective protocols of treatment.[65,82,85] Despite the emergence of new variants of the virus, mechanisms of the disease development remained unchanged and were not associated with a more severe course of the disease.[118-119] In most countries the mortality rate was very low. By the end of the second phase, worldwide statistics indicated the imminent end of the pandemic.[1]

During the third phase (23.01.21-22.07.21) of the pandemic, in various countries, mass vaccination was introduced to protect people against SARS-CoV-2. Coincidentally, a sudden rise in the number of new cases and deaths happened, and it could not be explained rationally. The highest number of monthly deaths was recorded between May 23, and June 22, 2021. The most dramatic evolution of the epidemic curve occurred in the countries where doctors had successfully battled COVID-19 during the first year of the pandemic [see

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appendix: Cambodia, Cuba, Laos, Malaysia, Mongolia, the Seychelles, Singapore, Shi Lanka, Taiwan, Tanzania, Thailand, Uruguay, Vietnam, etc.]. The further evolution of the pandemic was an undulating continuation of the third phase.

A group of countries where more than 90 % of deaths were recorded during the third phase included Botswana, British Virgin Islands, Cambodia, Cuba, Laos, Malaysia, Mongolia, Fiji, Papua New Guinea, Saint Kitts and Nevis; Seychelles, Sri Lanka, Taiwan, Thailand, Timor-Leste, Uruguay, and Vietnam.

After the end of the 3rd phase, during the next two months (#19-20) in the majority of countries analyzed, the number of deaths continued to increase. Dramatic increases in deaths during these months took place in the following countries: Albania, Aruba, Australia, Azerbaijan, Barbados, Belize, Benin, Bermuda, Burundi, Curaçao, Eswatini, French Polynesia, Gambia, Ghana, Guadeloupe, Guinea-Bissau, Ivory Coast, Israel, Kazakhstan, Libya, Malta, Martinique, Mauritius, Morocco, Nigeria, North Macedonia, Singapore, Saint Lucia, Somalia, Timor-Leste, Togo, the United Kingdom, and Vietnam.

In the following countries the number of deaths continued to increase even during the latest month analyzed (# 22): Burkina Faso, Cameroon, Congo, Djibouti, Gabon, Hungary, Laos, Latvia, Lesotho, Papua New Guinea, Poland, Romania, Singapore, Slovakia, South Sudan, Tanzania, Ukraine, etc.

6. Conclusions

Two years have passed since the Wuhan Municipal Health Commission announced a pneumonia epidemic. Despite the positive dynamics during October-November 2021, the current pandemic is not over yet, and additional research is necessary to identify the cause of the increase in the number of new cases and deaths observed during the third phase of the pandemic.

6.1. After simulating a forecast done by Neil M. Ferguson and his team (*Imperial College London*) in March 2020,[120] many countries introduced social distancing, quarantines and lockdowns. Despite objections to Mr. Ferguson's calculations from his own colleagues,[121] and the United Kingdom's removal of COVID-19 from the category of high consequence infectious disease,[122] quarantine measures were continued. As far as medical prophylactic measure in the form of global vaccination program is concerned, it had already been proposed before the new disease got its name.[115,123]

There are plenty of studies which revealed that in certain cases, various prophylactic measures used to prevent the spread of SARS-CoV-2 and other viruses and bacteria, could have negative effects on the human body,[124-225] have low efficacy or may even be useless in terms of prevention of diseases.[226-253]

Since the main target for SARS-CoV-2 are people with weak immunity,[13,40-42] and prolonged mental stress affects both the entire body,[124-126,254] and the immune system in particular,[255-259] a new study is needed to answer the question, if medical and non-medical measures used to prevent the spread of SARS-CoV-2 could affect natural immunity. This question is especially relevant for countries which had a dramatic increase in cases and deaths during the third phase of the pandemic. An affirmative answer to this question is highly probable since certain types of medical prophylactic products can reprogram immune system response,[163] and without a new dose of a booster immunity of the body declines after 3-6 months.[252] Moreover, there has been a tendency towards an increase in herpes zoster cases,[260-270] and "*the link between compromised immunity and herpes zoster has been recognized for more than half a century*".[271-272]

Since the list of criteria for exclusion from clinical trials with anti-SARS-CoV-2 vaccines included people who had received immune-modifying drugs,[273] due to early immunologic response to vaccination,[274] and people who have natural durable specific immunity after recovery from COVID-19,[275-284] these two groups of people should be analyzed separately, and at least four groups of studies are necessary, including:

1) unvaccinated people who have not received immunomodulatory drugs;
2) unvaccinated people who have received immunomodulatory drugs;
3) unvaccinated people who recovered from COVID-19 spontaneously or after treatment;
4) vaccinated people who received one, two or more doses of vaccine and boosters.

6.2. In July 2021 it was announced that after December 31, 2021, CDC would withdraw the request to the U.S. Food and Drug Administration for Emergency Use Authorization of the CDC 2019-Novel Coronavirus (2019-nCoV) Real-Time RT-PCR Diagnostic Panel.[285]

Previously, some experts had already rejected the reliability and validity of the RT-PCR test to be used for screening.[286-289] That decision has been done to avoid negative epidemic consequences of the false positive results which could be caused by contamination of the environment[290-294] or test kits,[288,295-301] by the limitations of the diagnostic method itself,[302] and errors of the software used,[303] as well as by application of a cycle threshold of 25-30 or higher.[304-306]

A number of false positive results could be dramatically increased if the RT-PCR test is used to conduct large-volume screening at the area of low prevalence of SARS-CoV-2.[307-309] Thus, mass-screening with RT-PCR test could create a false epidemic without a real basis.[310]

At the time when Dr. Tedros A. Ghebreyesus assumed the outbreak of the pandemic,[48] objective data for such a decision was not available yet. Therefore, no official documents were issued and published. Five days later, Dr. Ghebreyesus explained that WHO did not know how many people were infected, and invited all countries to fill up this informative gap, by suggesting: "We have a simple message for all countries: test, test, test".[311] Mass testing resulted in sudden outbreaks of COVID-19 in many countries and this fact could not be explained rationally based on the natural evolution of infectious diseases.[312]

Since the recent study by S. Shah, A. Stang, et al (2021) revealed that application of mass screening with RT-PCR test had no value to predict severe cases or deaths,[289,313] an additional study is required to answer the question – if screening with RT-PCR test can increase the number of deaths, especially in countries where quarantine facilities do not provide isolated rooms for each person suspected to be infected.[314-316]

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6.3. One can assume that the application of non-specialized premises for quarantine and treatment of people suffering from infectious diseases can lead to unpredictable consequences. For example, the conversion of a new general municipal hospital (#40) in Moscow City into a specialized hospital for COVID-19 patients without reconstructions according to the hygienic requirements for infectious hospitals resulted in the steady increase in hospital mortality. (Fig. 16) Three fourths of the patients died due to sepsis caused by *K. Pneumoniae*, *A. Baumannii*, *P. Aeruginosa*, *E. Coli*, *S. Aureus*, fungus, etc.[317]

Since these data were presented by the head physician of the modern and well equipped hospital, one can assume that mass mortality from nosocomial infection was a common occurrence in COVID-19 hospitals worldwide.[318-322]

Therefore, a thorough investigation of the causes of death is necessary to distinguish between deaths from COVID-19 and deaths from other causes. Many statistical errors caused by imperfect diagnostics and registration are likely would be found.[250,323-325]

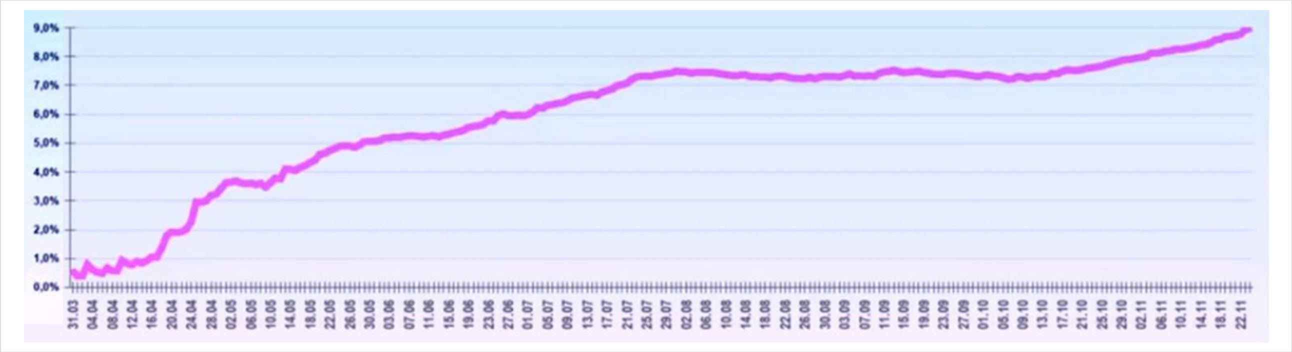

Figure 16. A steady increase in mortality in the leading anti-COVID-19 hospital in Moscow City.[317]

6.4. A comparison of different therapeutic methods and protocols used during the current pandemic should be done to identify the most effective ones.[65,82,85,86,326-329] An equally important task is to analyze information on the preventive effects of certain drugs, food supplements, vitamins and microelements.[330-347] This analysis should be carried out by experts in the appropriate field who have already demonstrated low mortality using their therapeutic protocols, but not by an outside reviewer who has no practical experience with analyzed remedies and who selects and rejects publications using an unprofessional view of the reviewed remedy or method. Otherwise, we can get negative results which we have already been warned by I. Prigogine et al., (1984): "what for generations had been a source of joy and amazement withers at its touch" (in this quote 'it' – means *the spirit of science*).[348] Global negative consequences of unprofessional review of the topic can be demonstrated by the example of the use of hydroxychloroquine and chloroquine, where reviewers "*were unable to confirm a benefit*" of these effective drugs.[84]

Thus, only complete information regarding the positive and negative impact[349] of medical and non-medical methods of diagnostics and prophylaxis of COVID-19 can help to organize effective measures to end the current pandemic and prevent a similar one from occurring in the future.

Presumably, there are several causes of the negative evolution of the current pandemic including (1) overreliance on PCR tests, (2) application of non-specialized premises for quarantine and treatment, (3) following therapeutic protocols used in countries with high number of deaths, (4) decrease in individual and herd immunity and (5) ignoring prophylactic treatment.

It can be suggested that the use of immunomodulatory drugs (for example, thymus extract or thymic peptides) should be included in the treatment of people with compromised T-cell immunity. Prophylactic as well as therapeutic protocols should also be changed from the 'standard' to 'personalized' ones.

Appendix includes illustrations for the following countries: Australia, Azerbaijan, Belarus, Cambodia, Cuba, Czechia, Denmark, Finland, Germany, Hungary, India, Indonesia, Israel, Italy, Japan, Kazakhstan, Laos, Malaysia, Mongolia, Morocco, Namibia, Norway, Paraguay, Russia, Poland, the Seychelles, Singapore, South Korea, Spain, Sri Lanka, Sweden, Taiwan, Tanzania, Thailand, Ukraine, the United Kingdom, the United States, Uruguay, Vietnam, Zimbabwe.

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Remark: A list of the references includes some articles or manuscripts, which have not been peer reviewed yet, or were published and then retracted. They are not recommended to doctors who have not enough knowledge and experience to evaluate the quality of a study.

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Appendix - Illustrations

Dynamics of the number of deaths during 22 months of the pandemic in various countries

Twenty three sets of databases, which dated the 22nd of each month from January 2020 to November 2021, were collected. The databases related to each month for every country were calculated by subtracting the previous month's data from the analyzed month's data. CFR, IFR, number of cases per 1 million (C/M) and death per 1 million (D/M) were counted.

Cumulative and Monthly number of cases, deaths, tests, CFR, C/M, D/M and population were presented in the form of a table (see an example for Australia). Graph illustrations for various countries included (a) Dynamics of cumulative number of deaths during 22 months of the COVID-19 pandemic; and (b) Monthly number of deaths due to COVID-19 during the pandemic.

These illustrations could help doctors of the respective countries to understand their errors that have led to an increase in the number of new cases and deaths, and to correct them.

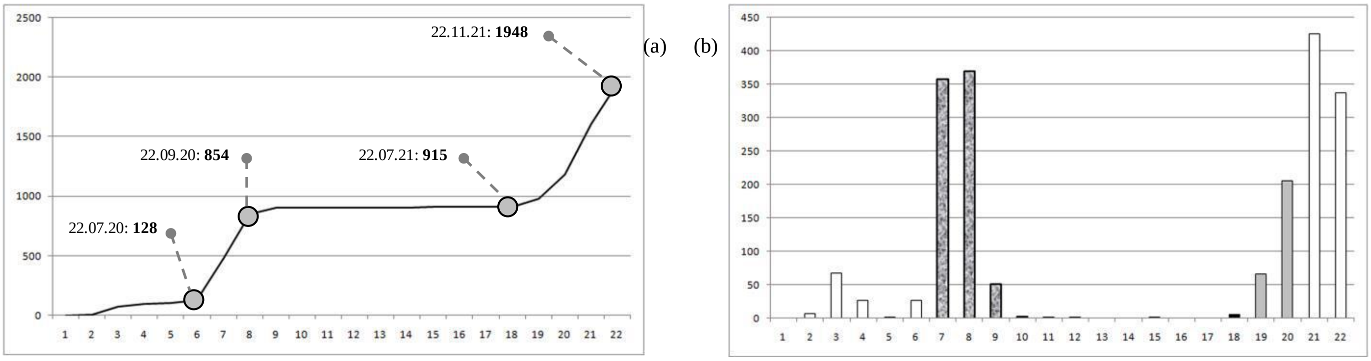
Australia

a) Cumulative number of cases, deaths, tests, population, CFR, IFR, C/M, D/M

#	Date	Cases	Deaths	Tests	Population	CFR	IFR	C/M	D/M
0	22.01.20	-	-	-	-	-	-	-	-
1	22.02.20	21	0	0	0	0	-	-	-
2	22.03.20	1353	7	0	0	0.517	-	-	-
3	22.04.20	6649	74	452441	0	1.113	-	-	-
4	22.05.20	7095	101	1170682	25466640	1.424	0.036	278.60	3.97
5	22.06.20	7474	102	2105974	25491691	1.365	0.063	293.19	4.00
6	22.07.20	12894	128	3641780	25515934	0.993	0.079	505.33	5.02
7	22.08.20	24602	485	5646546	25540986	1.971	0.242	963.24	18.99
8	22.09.20	26942	854	7351283	25566037	3.170	0.506	1053.82	33.40
9	22.10.20	27466	905	8420326	25590280	3.295	0.602	1073.30	35.37
10	22.11.20	27821	907	9713327	25615331	3.260	0.687	1086.11	35.41
11	22.12.20	28219	908	10720719	25639574	3.218	0.747	1100.60	35.41
12	22.01.21	28755	909	12642312	25664626	3.161	0.865	1120.41	35.42
13	22.02.21	28930	909	14089305	25689677	3.142	0.957	1126.13	35.38
14	22.03.21	29205	909	15209275	25712304	3.112	1.023	1135.84	35.35
15	22.04.21	29588	910	16481110	25737355	3.076	1.094	1149.61	35.36
16	22.05.21	30003	910	17797116	25762406	3.033	1.164	1164.60	35.32
17	22.06.21	30366	910	19821498	25786649	2.997	1.280	1177.59	35.29
18	22.07.21	32426	915	23457810	25810892	2.822	1.425	1256.29	35.45
19	22.08.21	44034	981	29437845	25836752	2.228	1.410	1704.32	37.97
20	22.09.21	90391	1186	36219104	25860995	1.312	1.021	3495.26	45.86
21	22.10.21	154489	1611	41907968	25885238	1.043	0.938	5968.23	62.24
22	22.11.21	199659	1948	46696043	25910289	0.976	0.977	7705.78	75.18

b) Monthly number of cases, deaths, tests, CFR, C/M, D/M

#	Date	Cases	Deaths	Tests	CFR	C/M	D/M
0	before 22.01.20	0	0	0	0	0	0
1	23.01.20 - 22.02.20	21	0	0	0	-	0
2	23.02.20 - 22.03.20	1332	7	0	0.526	-	-
3	23.03.20 - 22.04.20	5296	67	452441	1.265	-	-
4	23.04.20 - 22.05.20	446	27	718241	6.054	17.51	1.06
5	23.05.20 - 22.06.20	379	1	935292	0.264	14.87	0.04
6	23.06.20 - 22.07.20	5420	26	1535806	0.480	212.42	1.02
7	23.07.20 - 22.08.20	11708	357	2004766	3.049	458.40	14.00
8	23.08.20 - 22.09.20	2340	369	1704737	15.769	91.53	14.43
9	23.09.20 - 22.10.20	524	51	1069043	9.733	20.48	2.00
10	23.10.20 - 22.11.20	355	2	1293001	0.563	13.86	0.08
11	23.11.20 - 22.12.20	398	1	1007392	0.251	15.52	0.04
12	23.12.20 - 22.01.21	536	1	1921593	0.187	20.88	0.04
13	23.01.21 - 22.02.21	175	0	1446993	0	6.81	0.00
14	23.02.21 - 22.03.21	275	0	1119970	0	10.70	0.00
15	23.03.21 - 22.04.21	383	1	1271835	0.261	14.88	0.04
16	23.04.21 - 22.05.21	415	0	1316006	0	16.11	0.00
17	23.05.21 - 22.06.21	363	0	2024382	0	14.08	0.00
18	23.06.21 - 22.07.21	2060	5	3636312	0.243	79.81	0.19
19	23.07.21 - 22.08.21	11608	66	5980035	0.569	449.28	2.55
20	23.08.21 - 22.09.21	46357	205	6781259	0.442	1792.55	7.93
21	23.09.21 - 22.10.21	64098	425	5688864	0.663	2476.24	16.42
22	23.10.21 - 22.11.21	45170	337	4788075	0.746	1743.32	13.01



a) Dynamics of cumulative number of deaths in Australia during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Australia.
The 1st phase includes months # 1-6 (white columns); the 2nd phase includes months # 7-12 (grey-white columns);
the 3rd phase includes months # 13-18 (black columns); months # 19-20th (grey columns); months # 21-22nd (white columns);
The vertical axis shows number of cases (a) or deaths (b); the horizontal axis shows number of a week.

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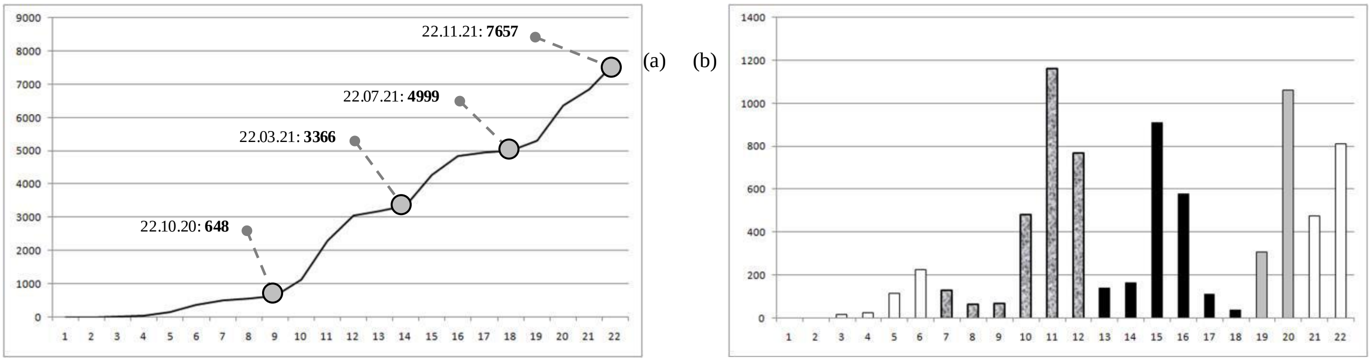
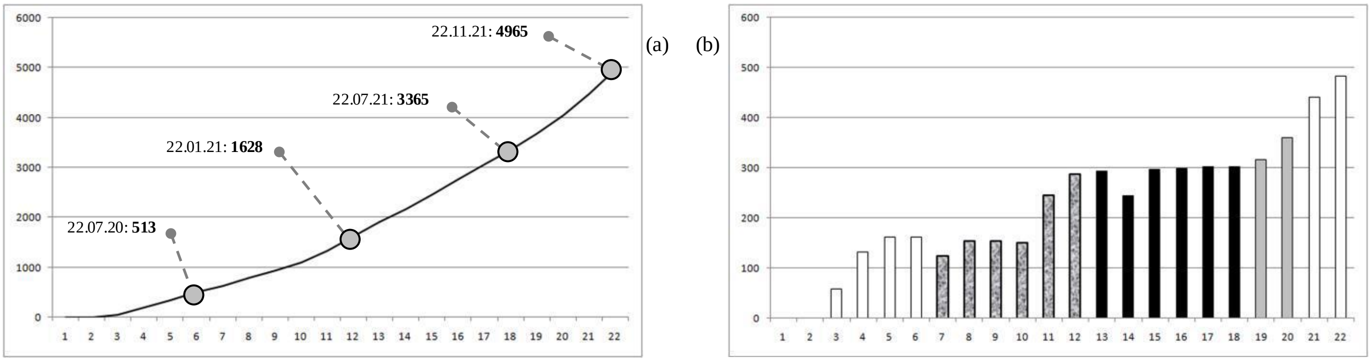
Azerbaijan



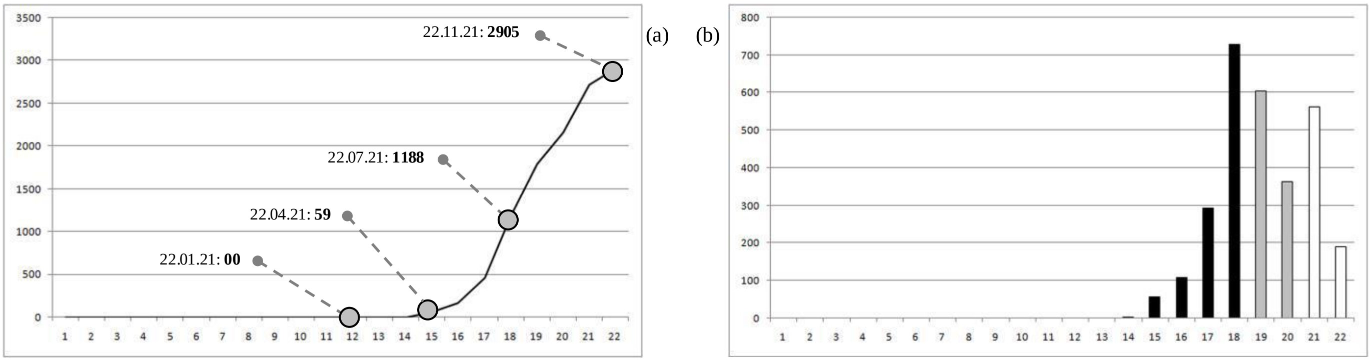
a) Dynamics of cumulative number of deaths in Azerbaijan during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Azerbaijan .

Belarus



a) Dynamics of cumulative number of deaths in Belarus during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Belarus.

Cambodia



a) Dynamics of cumulative number of deaths in Cambodia during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Cambodia.

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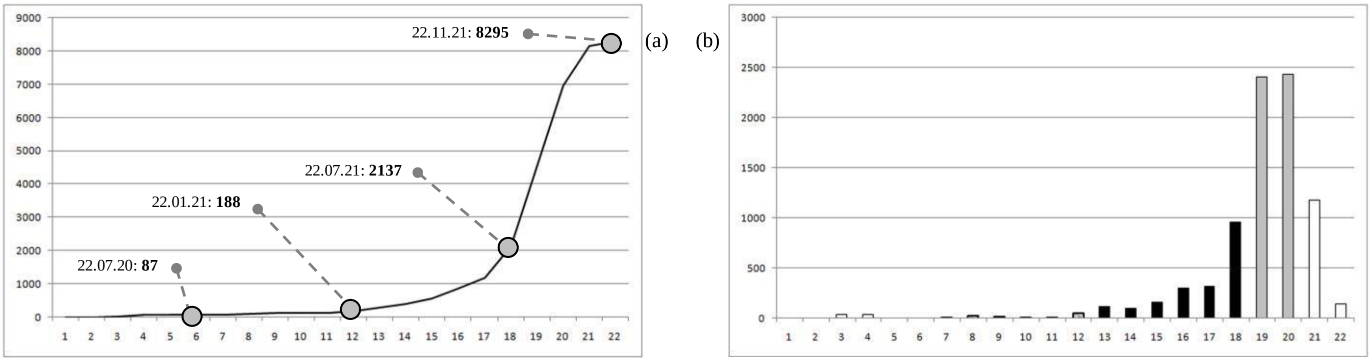
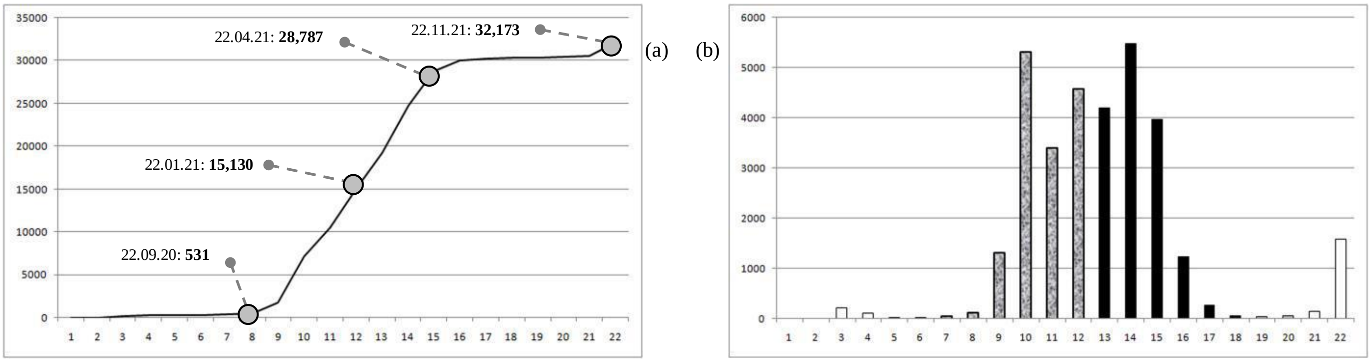
Cuba



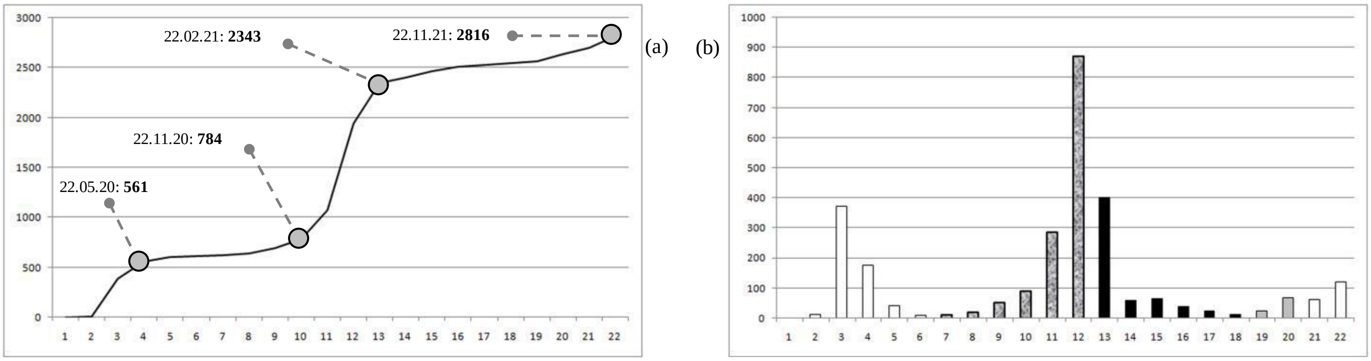
a) Dynamics of cumulative number of deaths in Cuba a during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Cuba.

Czechia



a) Dynamics of cumulative number of deaths in Czechia during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Czechia.

Denmark



a) Dynamics of cumulative number of deaths in Denmark during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Denmark.

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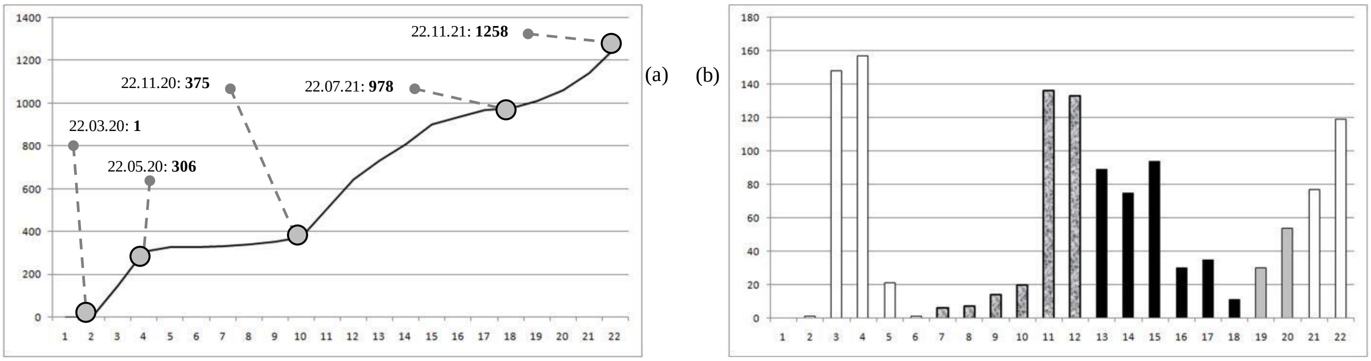
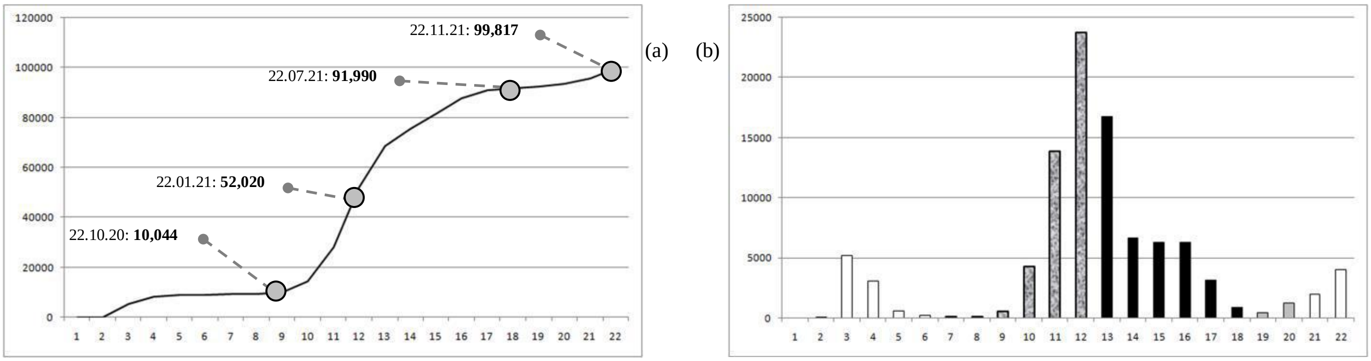
Finland



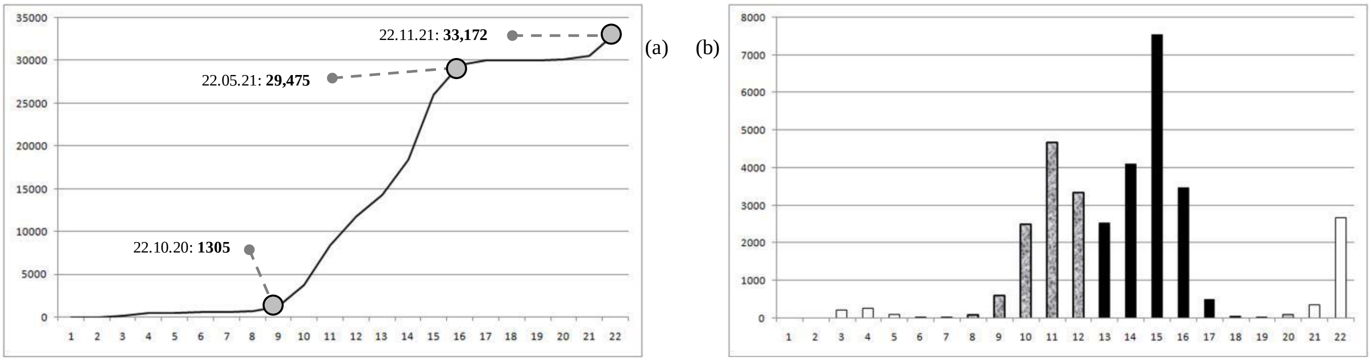
a) Dynamics of cumulative number of deaths in Finland a during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Finland.

Germany



a) Dynamics of cumulative number of deaths in Germany during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Germany.

Hungary



a) Dynamics of cumulative number of deaths in Hungary during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Hungary.

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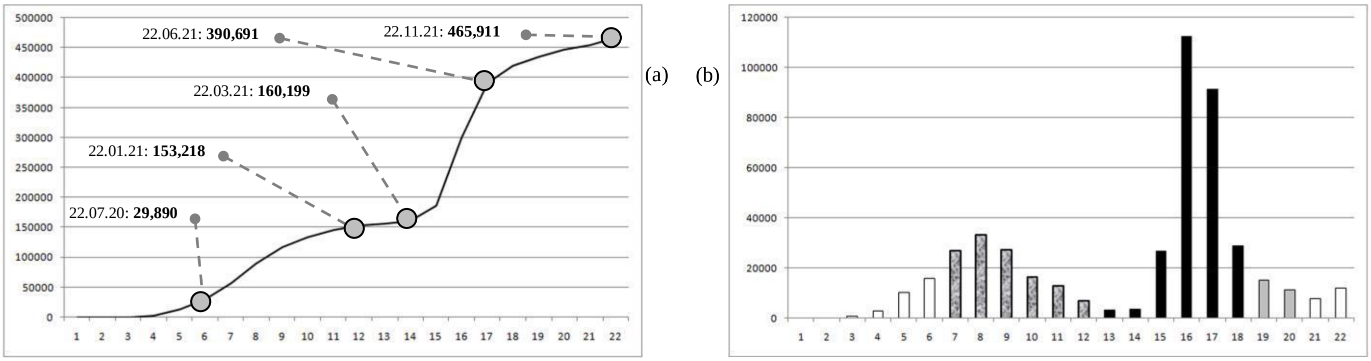
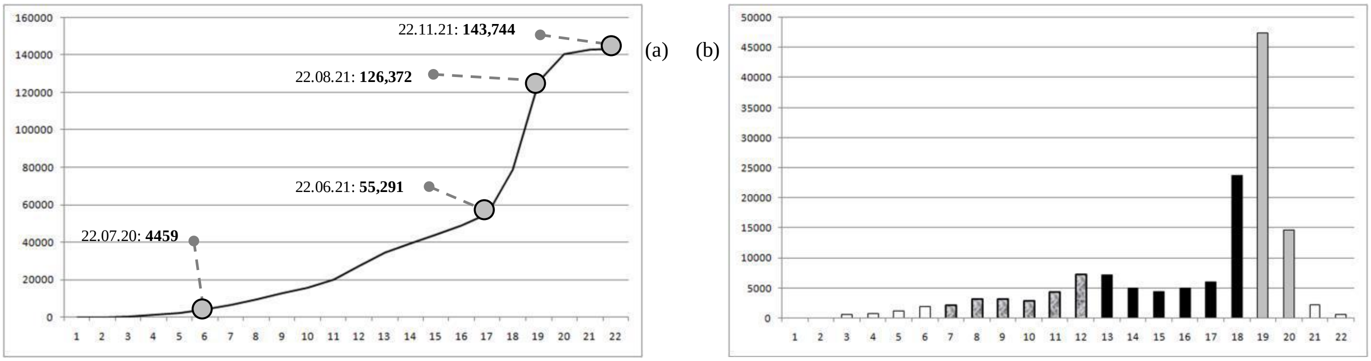
India



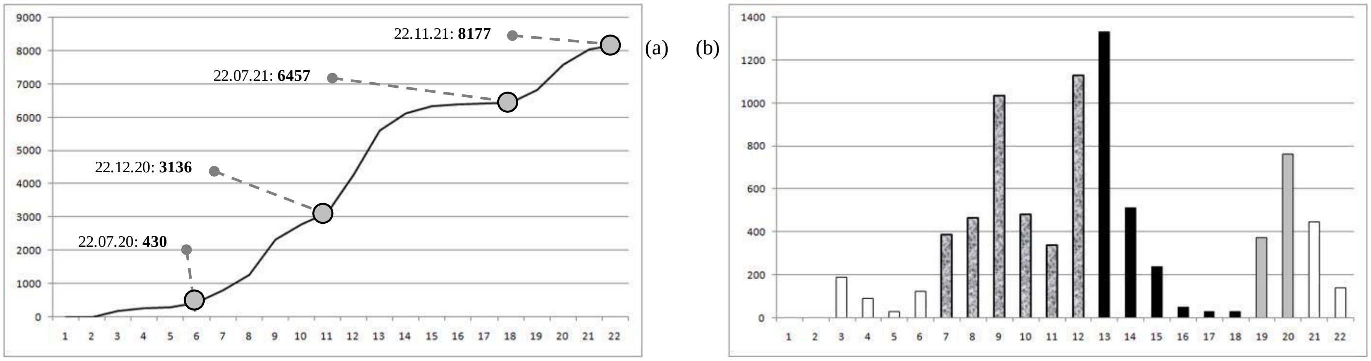
a) Dynamics of cumulative number of deaths in India during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in India.

Indonesia



a) Dynamics of cumulative number of deaths in Indonesia during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Indonesia.

Israel



a) Dynamics of cumulative number of deaths in Israel during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Israel.

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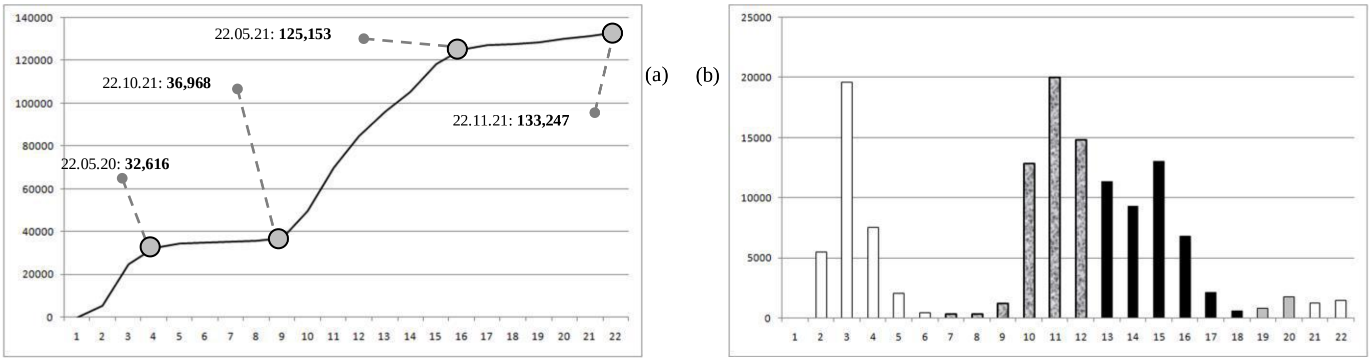
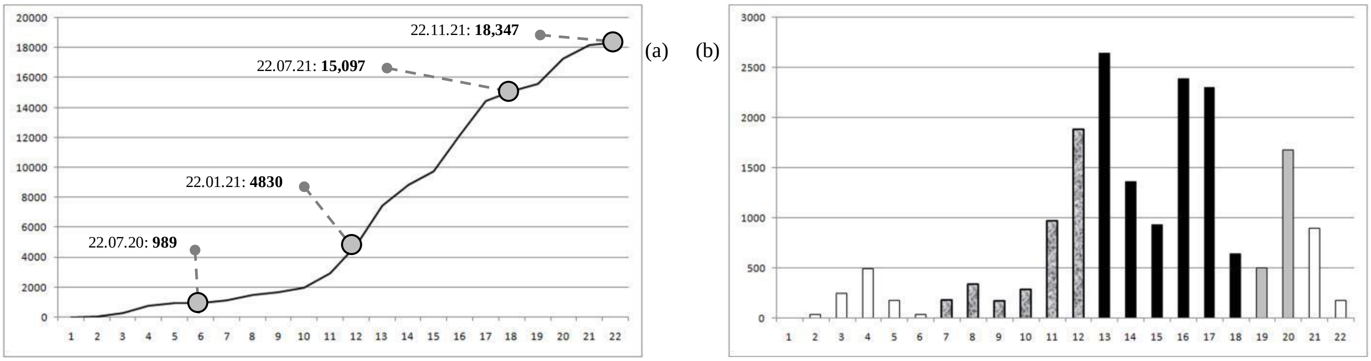
Italy



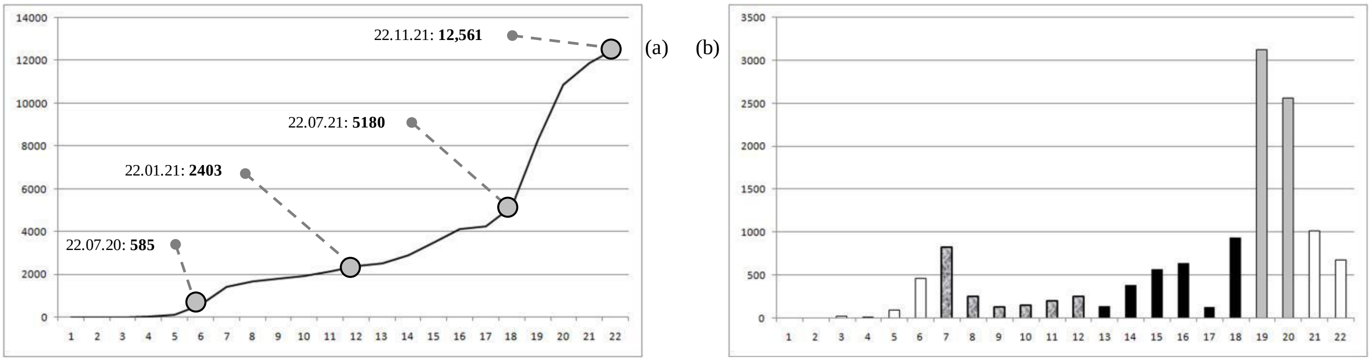
a) Dynamics of cumulative number of deaths in Italy during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Italy.

Japan



a) Dynamics of cumulative number of deaths in Japan during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Japan.

Kazakhstan



a) Dynamics of cumulative number of deaths in Kazakhstan during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Kazakhstan.

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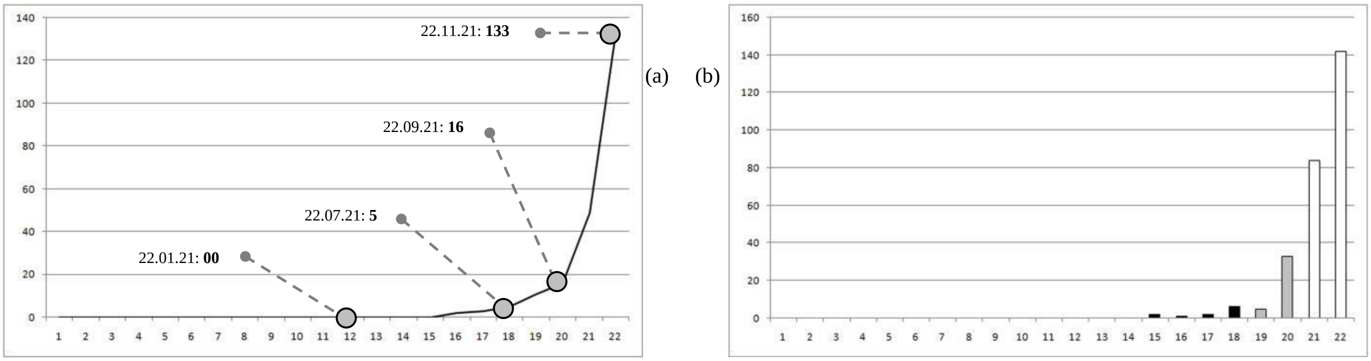
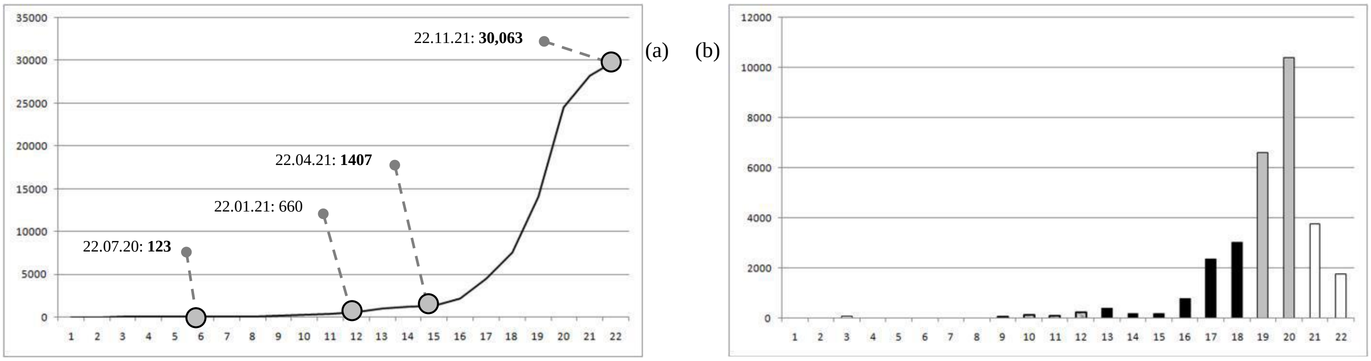
Laos



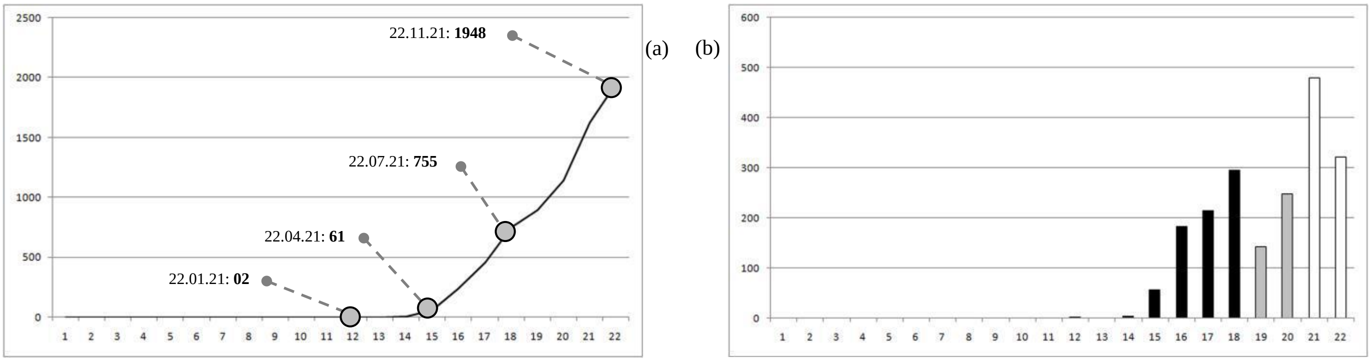
a) Dynamics of cumulative number of deaths in Laos during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Laos.

Malaysia



a) Dynamics of cumulative number of deaths in Malaysia during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Malaysia.

Mongolia



a) Dynamics of cumulative number of deaths in Mongolia during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Mongolia.

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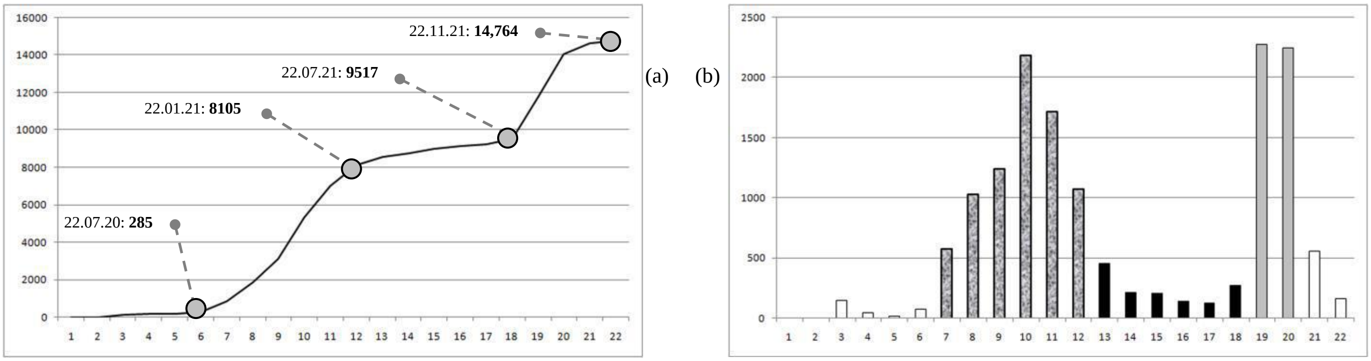
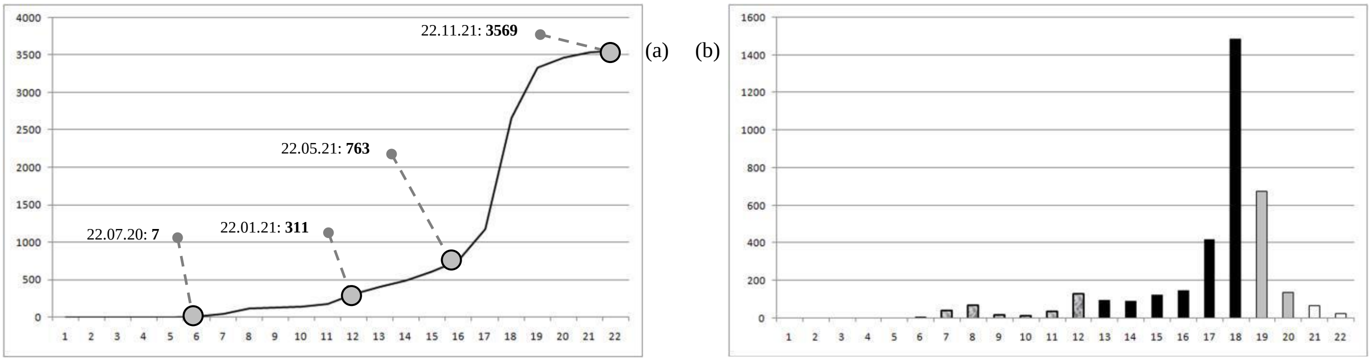
Morocco



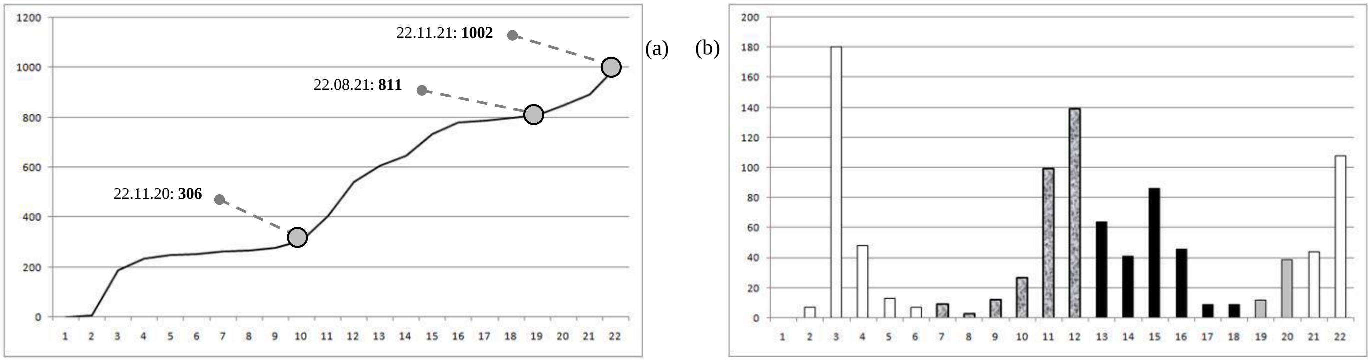
a) Dynamics of cumulative number of deaths in Morocco during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Morocco.

Namibia



a) Dynamics of cumulative number of deaths in Namibia during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Namibia.

Norway



a) Dynamics of cumulative number of deaths in Norway during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Norway.

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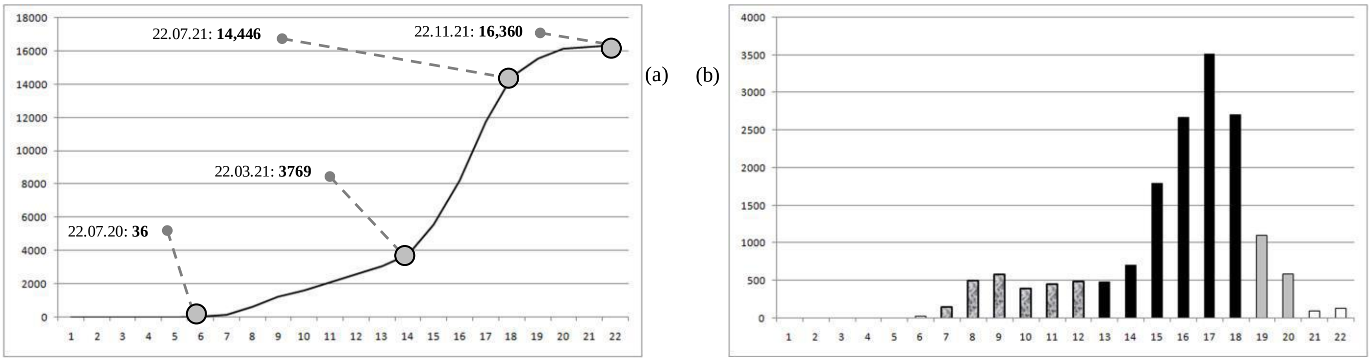
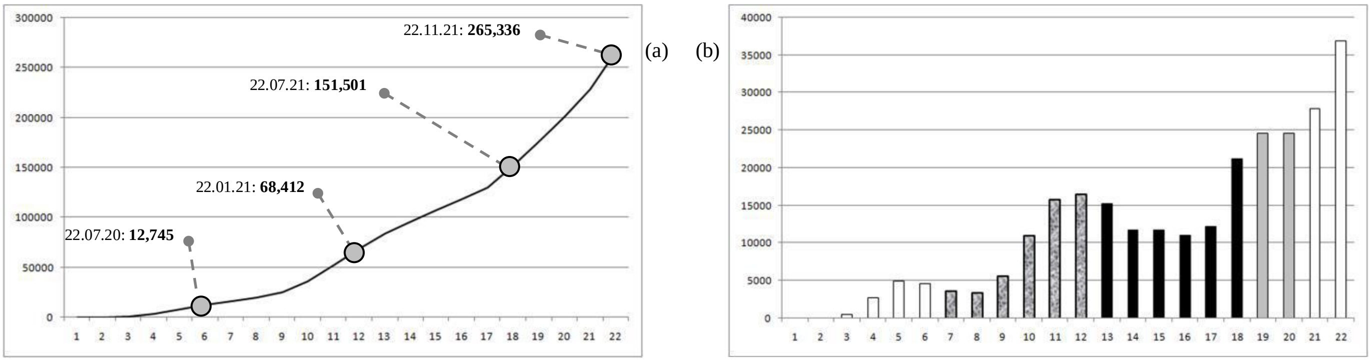
Paraguay



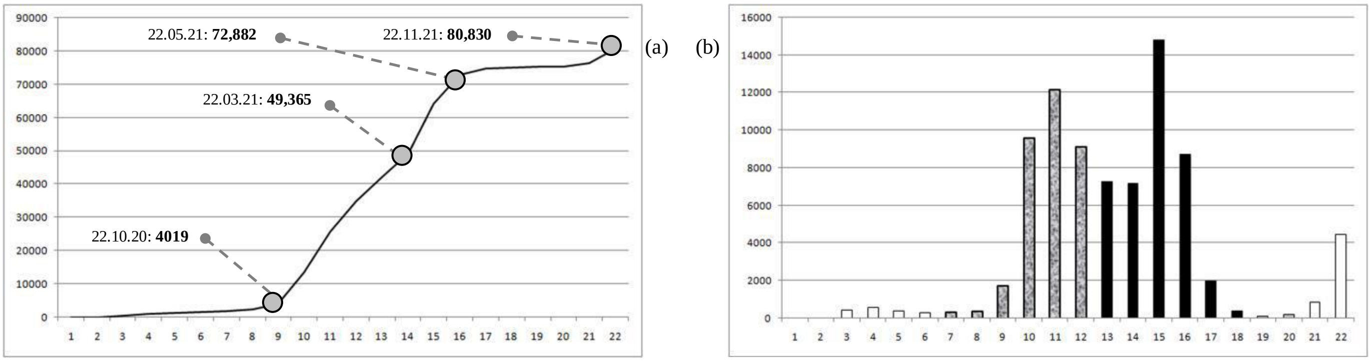
a) Dynamics of cumulative number of deaths in Paraguay during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Paraguay.

Russia



a) Dynamics of cumulative number of deaths in Russia during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Russia.

Poland



a) Dynamics of cumulative number of deaths in Poland during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Poland.

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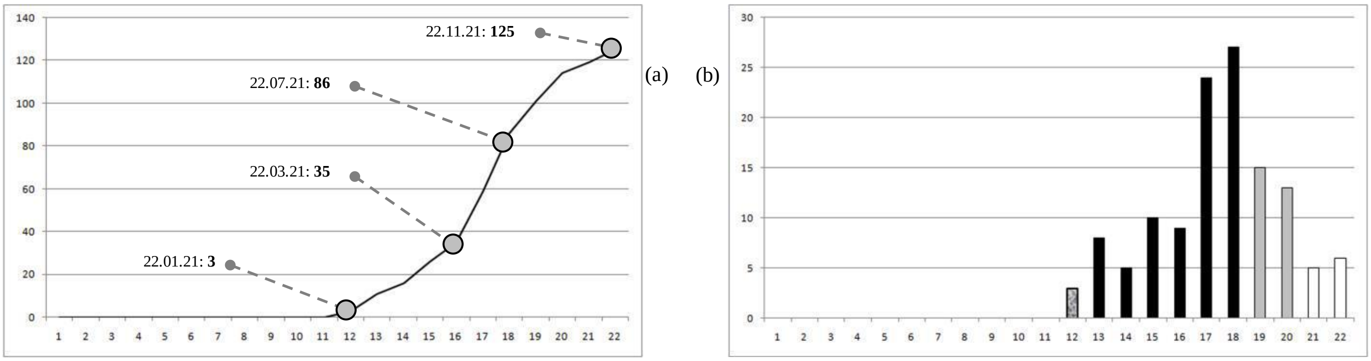
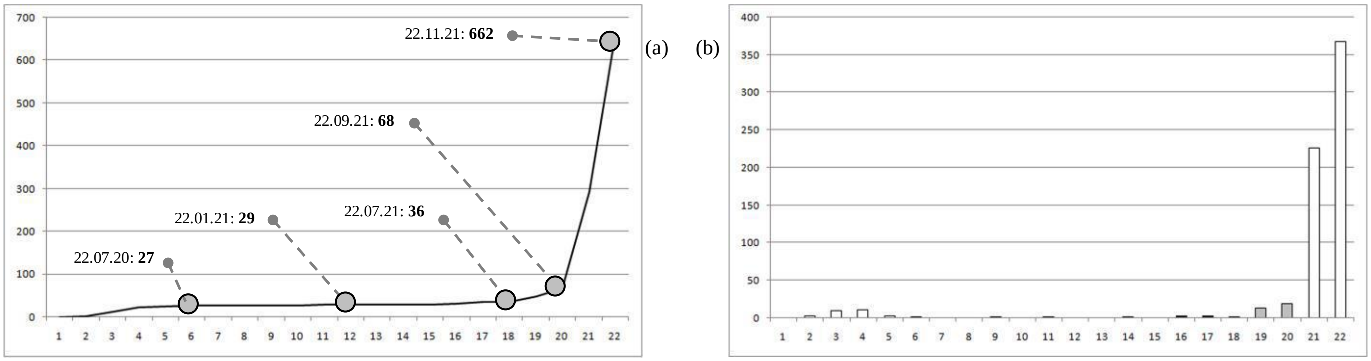
The Seychelles



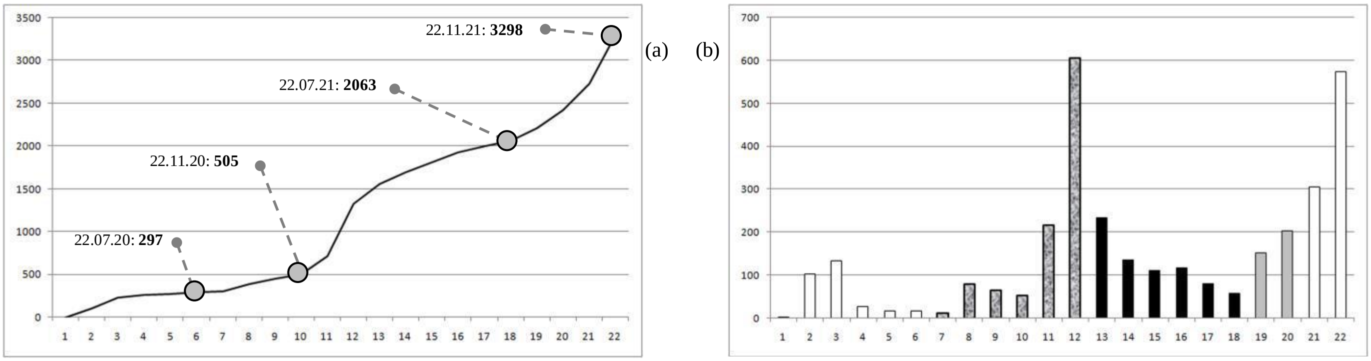
a) Dynamics of cumulative number of deaths in The Seychelles during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in The Seychelles.

Singapore



a) Dynamics of cumulative number of deaths in Singapore during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Singapore.

South Korea



a) Dynamics of cumulative number of deaths in S. Korea during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in S. Korea.

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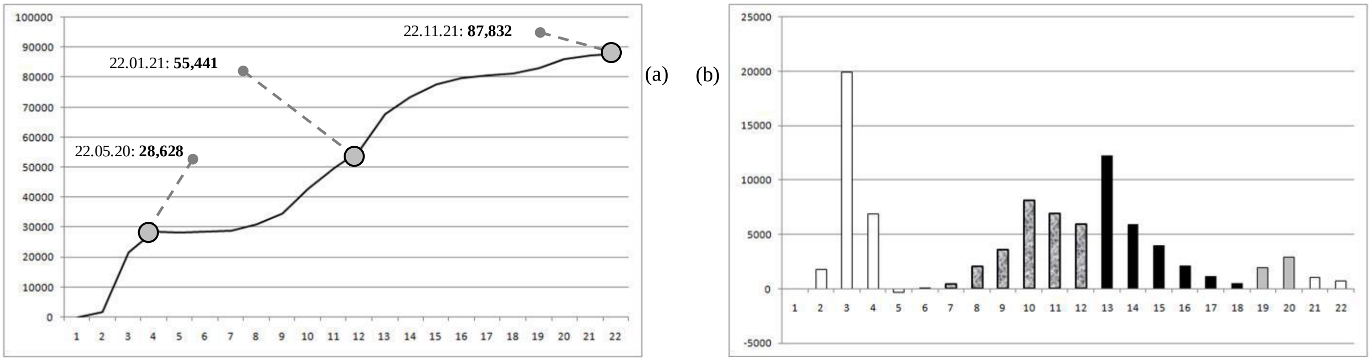
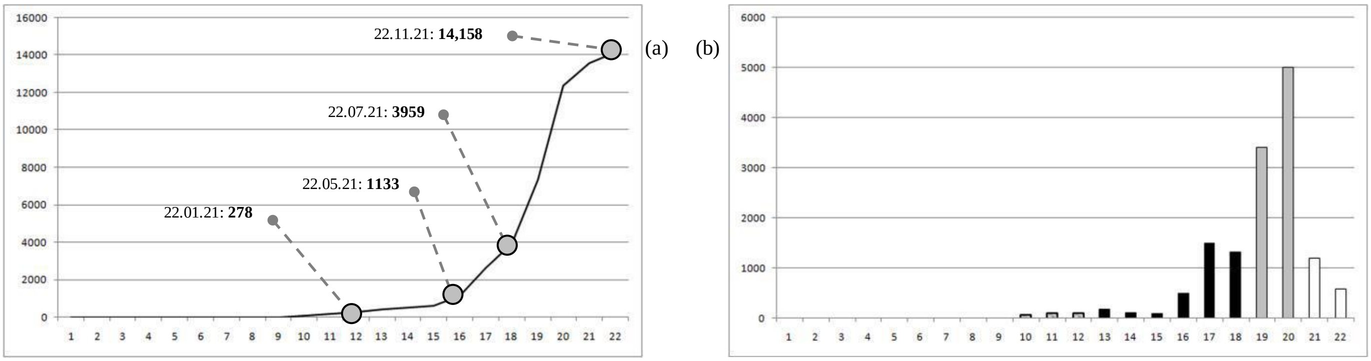
Spain



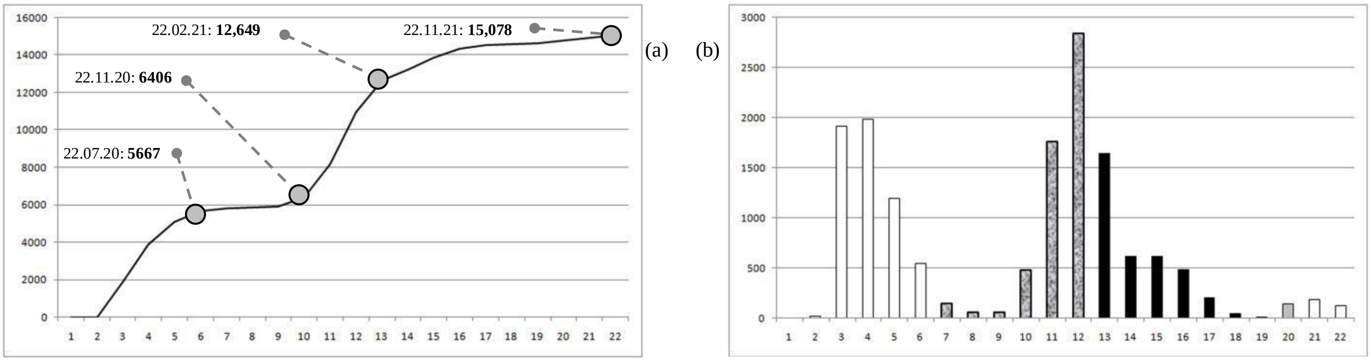
a) Dynamics of cumulative number of deaths in Spain during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Spain.

Sri Lanka



a) Dynamics of cumulative number of deaths in Sri Lanka during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Sri Lanka.

Sweden



a) Dynamics of cumulative number of deaths in Sweden during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Sweden.

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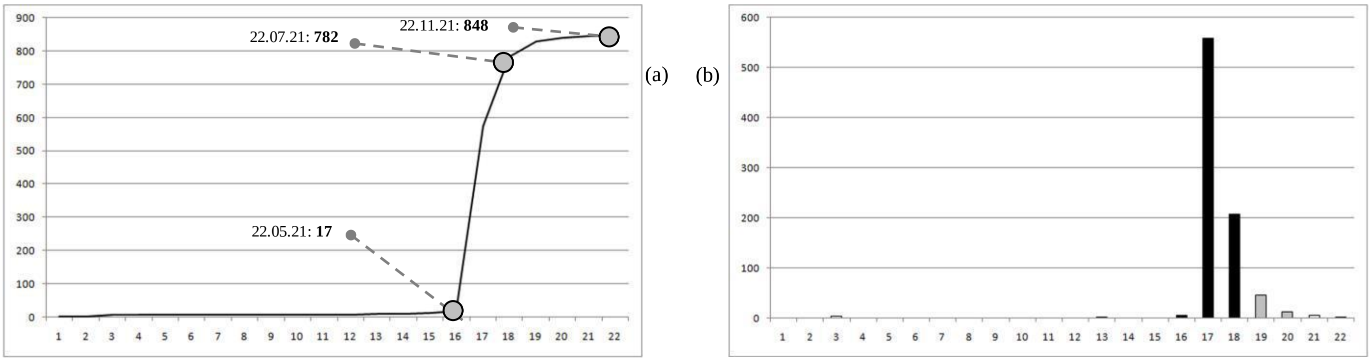
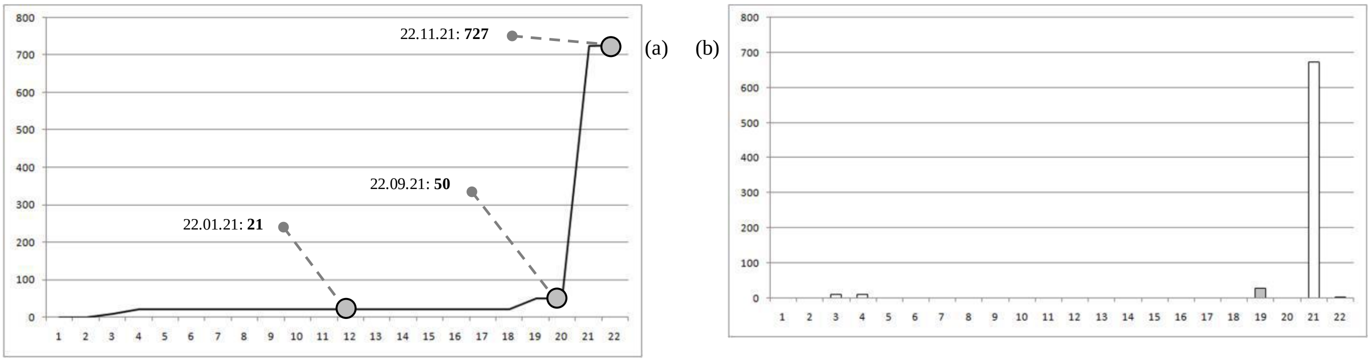
Taiwan



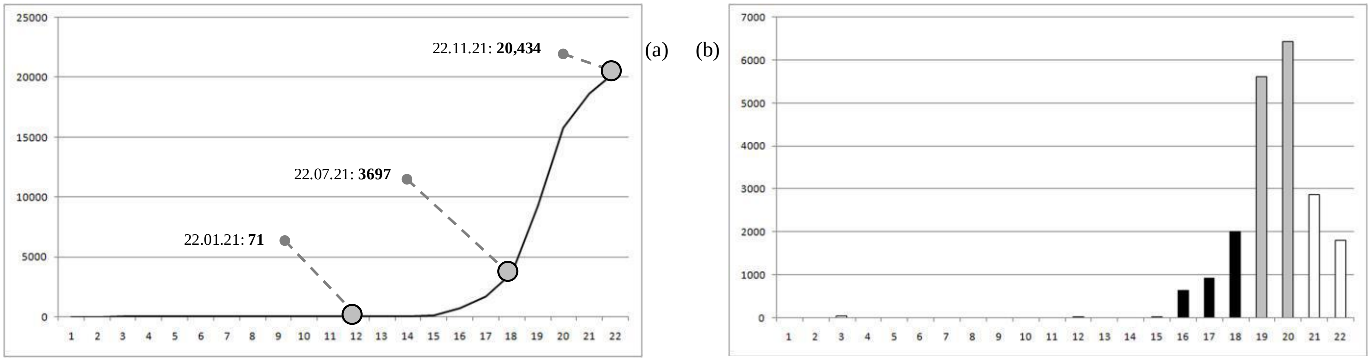
a) Dynamics of cumulative number of deaths in Taiwan during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Taiwan.

Tanzania



a) Dynamics of cumulative number of deaths in Tanzania during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Tanzania.

Thailand



a) Dynamics of cumulative number of deaths in Thailand during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Thailand.

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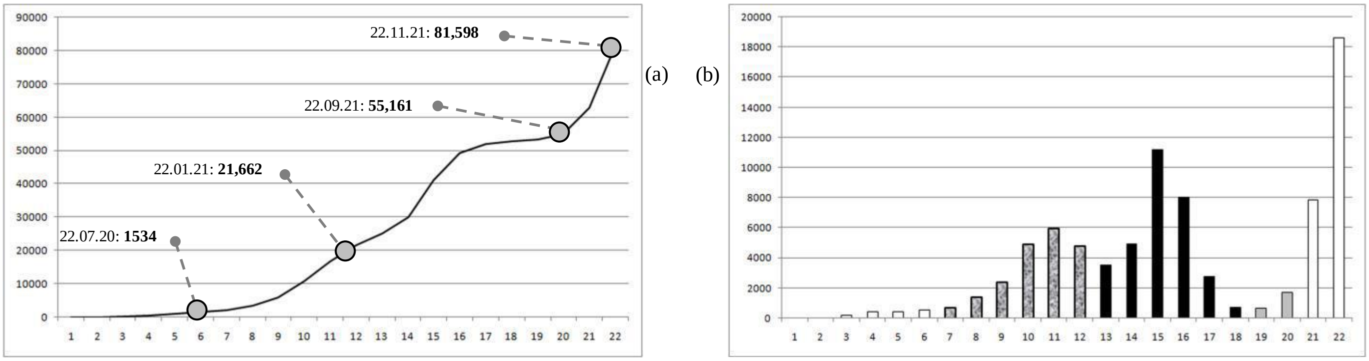
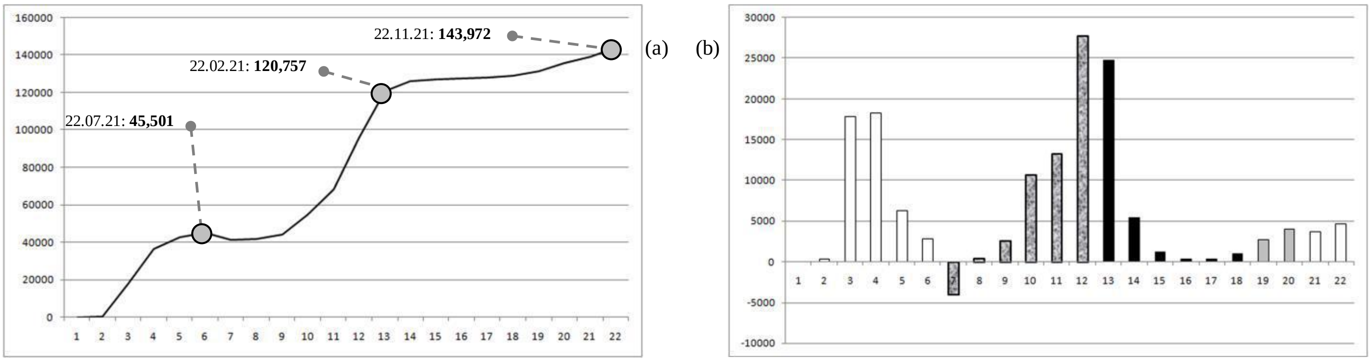
Ukraine



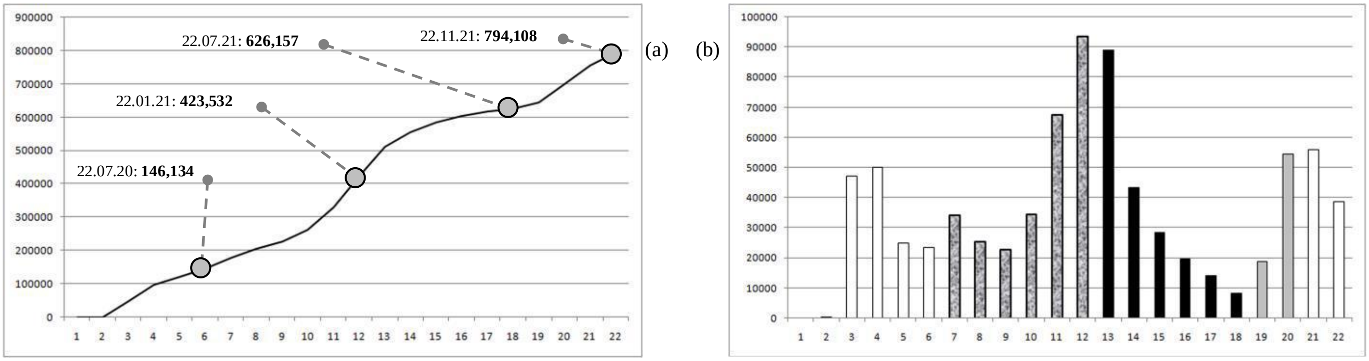
a) Dynamics of cumulative number of deaths in Ukraine during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Ukraine.

The United Kingdom



a) Dynamics of cumulative number of deaths in The United Kingdom during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in The United Kingdom.

The United States



a) Dynamics of cumulative number of deaths in The United States during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in The United States.

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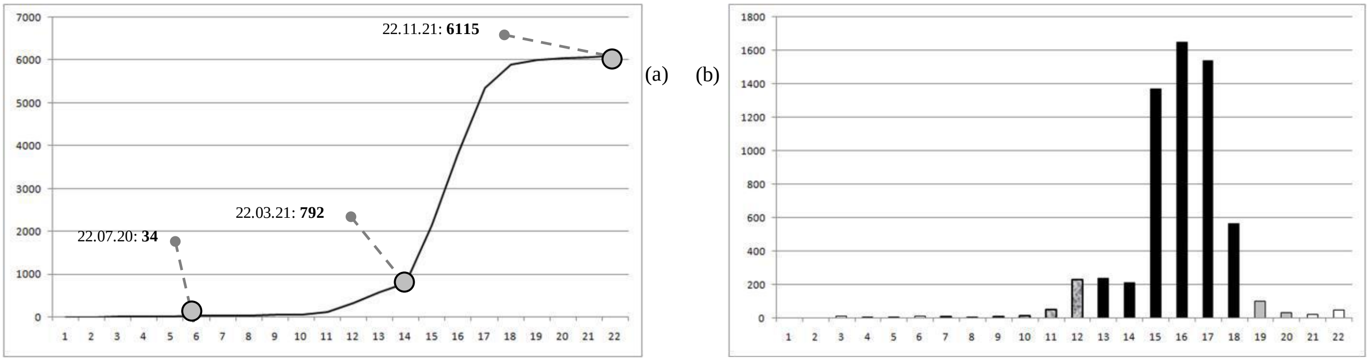
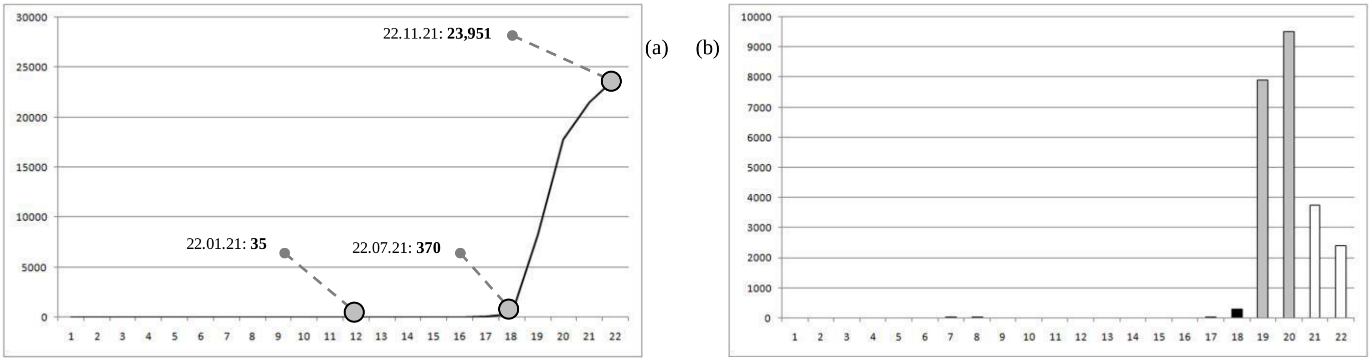
Uruguay



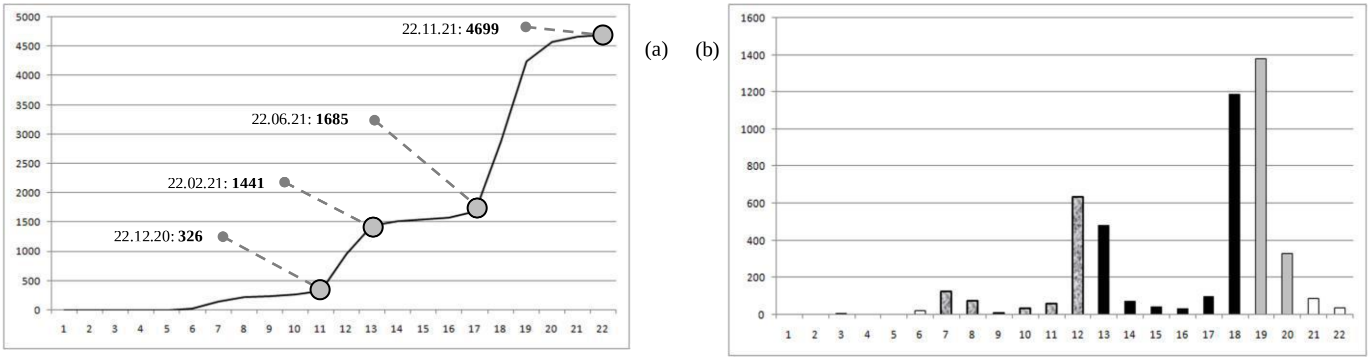
a) Dynamics of cumulative number of deaths in Uruguay during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Uruguay.

Vietnam



a) Dynamics of cumulative number of deaths in Vietnam during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Vietnam.

Zimbabwe



a) Dynamics of cumulative number of deaths in Zimbabwe during 22 months of the COVID-19 pandemic
b) Monthly number of deaths due to COVID-19 during the pandemic in Zimbabwe.

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One year of COVID-19 pandemic: Case fatality ratio and infection fatality ratio. A systematic analysis of 219 countries and territories.

Mikhail Teppone

Medical Director, Nano City Holdings Berhad,
No. 1, Jalan Sungai Jeluh 32/192,
Shah Alam, 40460, Selangor, Malaysia.
ORCID: 0000-0002-5366-3188;
Email: mikhail.teppone@gmail.com

ABSTRACT

Background. January 2021 marked one year since the start of COVID-19 pandemic: it is the time of intermediate conclusions.

Objective. To evaluate CFR and IFR due to COVID-19 in various countries and territories, and to study if parameters of a population age affect CFR and IFR.

Material and Methods. The databases of 219 countries were collected on the Worldometers, Index Mundi, Country Meters and World Bank websites. The processing of data was divided into two parts: the first part dealt with the calculation and analysis of CFR while the second, the calculation and analysis of IFR.

Results. The calculations revealed that in 74 out of 219 countries, CFR was less than 1.00 %, in 69 countries it varied between 1.00 % and 2.00 %, and in 76 countries it was more than 2.00 %. The calculation of IFR revealed that in 183 countries, IFR was less than 1.00 %, in 22 countries IFR was between 1.00 % and 2.00 %, and only in 14 out of 219 countries IFR was more than 2.00 %.

A correlation between IFR and parameters of a population age was found: the less median age and the percentage of 'aged' people – the less value of IFR, although, there was no correlation between parameters of a population age and CFR.

Conclusion. The global health care system has gone through a year of serious trial caused by COVID-19 and appeared to have emerged victorious. In the majority of countries analyzed, the parameters of mortality due to COVID-19 were at a low level. So, there seems to be an objective basis for optimism and hope for an early end to the pandemic.

Key words: COVID-19, Mortality rate, CFR, IFR, Case fatality ratio, Infection fatality ratio.

Abbreviations: Case fatality ratio (CFR); Infection fatality ratio (IFR); World Health Organization (WHO); The Coronavirus Disease 2019 (COVID-19).

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One year of COVID-19 pandemic: Case fatality ratio and Infection fatality ratio. A systematic analysis of 219 countries and territories.

Introduction

Fatality rate. There are two most important characteristics of infectious diseases: the first is a case fatality ratio (CFR) and the second, an infection fatality ratio (IFR). Case fatality ratio is the proportion between the number of patients who died from COVID-19 and the number of confirmed cases of COVID-19, while Infection fatality ratio is the proportion between the number of patients who died from COVID-19 and the number of estimated cases infected with SARS-CoV-19 [1].

Case fatality ratio. In the first report provided by a group of experts from Imperial College London, there were 41 confirmed cases of COVID-19 with 2 deaths (17.01.20) [2], so, the CFR was 4.88 %. In the second report provided by the same group of experts, there were 440 confirmed cases with 9 deaths (22.01.20) [3]. Thus, the CFR was 2.05 %. In a study done by L.Liang, et al, (2020) the authors discussed a strange phenomenon of the current pandemic - "Why the Covid-19 mortality rate varies so greatly across countries, from over 16 % in France and Belgium to less than 0.1 % in Singapore and Qatar" [4]. In a recent study conducted in Malaysia, the authors also noted a wide variation of CFR worldwide and highlighted the low CFR in their country [5].

Infection fatality ratio. To calculate an IFR one needs to know the number of deaths from COVID-19, the total number of confirmed cases of the disease and the number of people who could be infected with the SARS-CoV-2 virus, yet suffered the disease asymptomatically or with minimal symptoms that did not attract the attention of the patient and doctors [1]. To identify the total number of infection prevalence, tests were carried out for the presence of the viral genome (Polymerase chain reaction), or for specific antibodies against SARS-CoV-2 virus (IgM and IgG). Due to the fact that polymerase chain reaction provided positive results for a limited time after infection, and specific antibodies were produced and circulated in the blood of an infected person only for several months [6, 7], the percentage of seroprevalence would always be lower than the real one, and, therefore, IFR from COVID-19 would be always overestimated.

In the second report submitted by the aforementioned group of experts from Imperial College London dated January 22, 2020, there were 9 deaths, 440 confirmed cases, and the estimated number of infected people reached 4,000 [3]. Thus, the IFR was 0.23 %. According to a research conducted by M. Neil et al. (2020), the IFR was most likely to be in the range of 0.30–0.50 %, and it should not exceed 1.00 % [8]. In yet another study by A. Rostami, et al. (2020), covering the time from the start of the pandemic to August 14, 2020, the estimated number of all infected persons reached 263,565,606 people [9]. On the same day, according to data presented on the Worldometers website [10], there were 777,073 deaths from COVID-19, thus, the IFR was equal to 0.29 %.

In the article published by J. Ioannidis (2020), at the end of October 2020, worldwide, the number of infected people reached 10 %, and the IFR was between 0.15 % and 0.20 % [11].

Database. In this study, information on the number of reported deaths caused by COVID-19, reported cases of COVID-19, tests performed and population were collected on the Worldometers website. This site does not have investors, donors or grants that could influence the information published. The data published on the Worldometers website is compiled from over 5,000 sources, including official reports from the respective countries analyzed [10]. Information on the median age and percentage of the population aged 65 and above were obtained from the IndexMundi [12], Country Meters [13] and World Bank [14] websites.

The processing of data collected on January 22, 2021, was divided into two parts. The first involved calculating and analyzing CFR and the second, calculating and analyzing IFR. Based on the results obtained, corresponding graphs were prepared.

1. Case fatality ratio among COVID-19 patients in 219 countries

Objective. To study Case Fatality Ratio in 219 countries,[1] and to evaluate if parameters of a population age affect CFR.

1.1. Calculation of CFR among COVID-19 patients of 161 countries.

Material and Methods. To calculate the CFR worldwide, the databases of 219 countries with a total population of 7,801,382,128 people were collected on the Worldometers on January 22, 2021. To increase the homogeneity of the main group of study, countries with death numbers of fewer than 50 were excluded from further analysis.

The main study group included 161 countries, with a total population of 7,529,891,314 people. These countries had 97,225,719 confirmed cases of COVID-19 and 2,084,079 fatal cases due to the disease. For each country, the CFR was calculated by dividing the number of deaths by the number of confirmed cases.

Results. The overall case fatality ratio, derived by dividing the number of deaths (n=2,084,079) by the number of confirmed cases (n=97,225,719), was 2.14 %.

In the group of countries analyzed, the CFR ranged from 0.17 % in Qatar to 28.94 % in Yemen, and the average value of CFR was 2.20 ± 2.48 %. Due to the fact that the CFR values in Mexico (8.56 %) and Yemen (28.94 %) significantly exceeded the CFR values of other countries with high CFR values (China – 5.23 %; Egypt - 5.50 %; Sudan - 6.10 %; Ecuador - 6.16 %; Syria - 6.44 %), data from Mexico and Yemen were excluded from further calculation.

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[1] Here and below 'Countries' means 'Countries and Territories'.

1.2. Calculation of CFR among COVID-19 patients of 159 countries

Material and Methods. In the subsequent calculation, 159 countries (72.60% of 219) with a total population of 7,370,020,129 people (94.47% of 7.801.382.128), with 95,534,660 COVID-19 cases, and 1,939,096 fatal cases were included.

Results: In 159 countries, CFR ranged from 0.17% in Qatar to 6.45 % in Syria, with an average value of CFR = 1.99 ± 1.20 %. Based on the calculated CFR values, all countries were divided into 13 groups as shown in Figure 1.

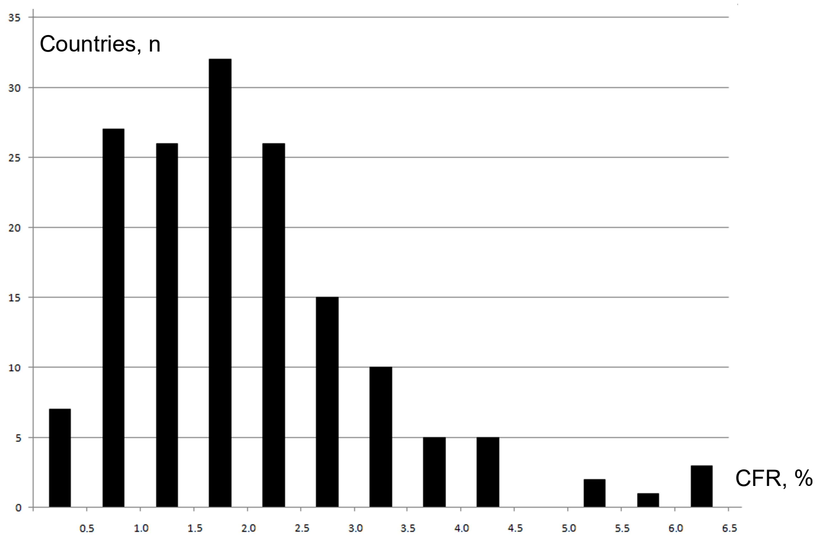

Figure 1: Distribution of 159 countries into 13 groups according to CFR value.
Group numbers: 1) CFR < 0.5%, n=7; 2) 0.5-1.0%, n=27; 3). 1.0-1.5%, n=26; 4). 1.5-2.0%, n=32; 5) 2.0-2.5%, n=26; 6) 2.5-3.0%, n=15; 7) 3.0-3.5%, n=10; 8) 3.5-4.0%, n=5; 9) 4.0-4.5%, n=5; 10) 4.5-5.0%, n=0; 11) 5.0-5.5%, n=2; 12) 5.5-6.0, n=1; 13) 6.0-6.5%, n=3.

The 1st group with the lowest CFR (<0.50 %) included 7 countries: Qatar (0.17 %), UAE (0.29 %), Bahrain (0.37 %), Malaysia (0.37 %), Botswana (0.47 %), French Guiana (0.50 %) and Sri Lanka (0.50 %).

The largest 4th group (CFR = 1.50-2.00 %) included 32 countries where the CFR varied from 1.50 % to 2.00 %: Bangladesh (1.50%), Malta (1.51%), Finland (1.54%), Libya (1.54%), Ireland (1.54%), Ethiopia (1.55%), Equatorial Guinea (1.60%), Panama (1.62%), Cameroon (1.62%), Portugal (1.63%), Czech Republic (1.63%), Slovakia (1.64%), Togo (1.66%), USA (1.66%), Kyrgyzstan (1.67%), Hong Kong (1.69%), South Sudan (1.70%), Guadeloupe (1.71%), Saudi Arabia (1.73%), Morocco (1.74%), Kenya (1.75%), Switzerland (1.77%), South Korea (1.78%), Latvia (1.79%), Trinidad and Tobago (1.79%), Austria (1.82%), Armenia (1.83%), Ukraine (1.83%), Russia (1.86%), Albania (1.86%), Suriname (1.88%), and the Philippines (1.99%).

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The groups # 9-13, where CFR exceeded 4.00 %, included 11 countries: Mali (4.03%), Bulgaria (4.05%), Iran (4.23%), Afghanistan (4.35%), Liberia (4.42%), Bolivia (5.04%), China (5.23%), Egypt (5.50%), Sudan (6.10%), Ecuador (6.16%), and Syria (6.44%).

Conclusion.

The calculations done in this section showed that in 34 out of 159 countries, the case fatality ratio was less than 1.00%, in 58 countries it varied between 1.00% and 2.00%, and in 67 countries it was more than 2.00%. In 7 out of 159 countries, the CFR was less than 0.50%.

1.3. Calculation of CFR among patients of 58 countries excluded from the main study

Material and Methods. The group of countries excluded from the main study consisted of 18 countries without fatal cases related to COVID-19, and 40 countries where the number of fatal cases due to COVID-19 was from 1 to 49. In these 58 countries with a total population of 271,490,814 people there were 132,846 cases of COVID-19 and 578 deaths caused by COVID-19. For each country, the CFR was calculated by dividing the number of deaths by the number of confirmed cases.

Results. Since there were no fatal cases due to COVID-19 in 18 out of the 58 countries, CFR was 0.00 % (<0.50%). In the remaining 40 countries, CFR ranged from 0.05 % in Singapore to 10.00 % in Western Sahara, with an average CFR value of 1.57±2.09 %. In 22 out of 40 countries CFR was less than 1.00 %, in 11 countries CFR was between 1.00 % and 2.00 %, and in the remaining 7 countries, CFR was more than 2.00 %. In 13 out of 40 countries CFR was less than 0.50 %.

Conclusion. If the previous calculations done in section 1.2, and the CFRs of Mexico and Yemen were to be taken into account, then in 74 out of 219 countries, CFR was less than 1.00 %, in 69 countries CFR varied between 1.00 and 2.00 %, and in 76 countries, CFR was more than 2.00 %. In 38 out of 219 countries, CFR was less than 0.50 %.

1.4. Analysis of the effect of population age on CFR among COVID-19 patients

Background. According to the databases which dealt with population age [14], only one out of 11 countries with CFR>4.00 % - Bulgaria, was included in the list of the top 50 countries with the largest percentage of old adults.

Material and Methods. To study the effect of age on CFR, two parameters were used – median age of a population, and the percentage of 'aged' people who were 65 years and above [12-14]. 218 countries were divided into two groups: the first group consisted of 109 countries where CFR was less than a median value (Libya, CFR=1.54 %), while the second group consisted of the remaining 109 countries where CFR was more than the median value.

There were also comparisons of the same parameters in the group of countries with low, medium and high case fatality rates.

Results. In the first group of 109 countries, the average value of median age was 31.51±8.92 years, and aged people accounted for 9.84±6.57 % of the total population. In the second group of 109 countries, these parameters were 31.44±9.75 years and 10.14±6.68 %, respectively. There was no significant difference between analyzed parameters counted for both groups of countries ($p>0.05$).

In the group of 74 countries with CFR<1.00%, the average median age was 32.22±8.69 years, and aged people accounted for 9.85±6.29 % of the total population; in the group of 69 countries (CFR: 1.00-2.00%), the analyzed parameters were 31.80±9.54 years and 10.42±6.92 %; and in the group of 76 countries (CFR>2.00 %) the analyzed parameters were 30.38±9.76 years and 9.66±6.73 %, respectively. There was no significant difference between analyzed parameters counted for each of the three groups of countries.

Conclusion. The calculations done in this section revealed a wide variation of CFRs among different countries, but CFR value was not dependent on median age and percentage of aged people living in the analyzed countries.

1.5. Dynamics of CFR changes during 52 weeks (Mar 8, 2020 – Mar 6, 2021).

Objective. To study the dynamics of CFR after the announcement of the pandemic on March 11, 2020.

Material and Methods: To calculate the dynamics of CFR worldwide the databases of global daily new cases and daily deaths during 52 weeks (Mar 8, 2020 – Mar 6, 2021) were collected on the Worldometers website on March 11, 2021. During the analyzed time there were 116,959,185 new cases of COVID-19 and 2,596,118 deaths caused by COVID-19 [10].

Since a weekly cycle of mortality among patients with COVID-19 was discovered [15], every week was considered a separate unit. The sum of new cases and the sum of deaths were calculated for each of the 52 weeks. After that the 52 CFRs were calculated by dividing the number of weekly deaths by the number of weekly new cases. Daily CFR was calculated too.

Results. The overall global CFR value was 2.22 %. The highest weekly CFR = 8.51% was calculated for the 6th week (Apr 12-18, 2020), and the lowest weekly CFR = 1.31% was calculated for the 34th week (Oct 25-31, 2020). Dynamics of the weekly CFR is illustrated in Figure 2. The highest daily CFR = 9.51 % was on Apr 17, 2020, and the lowest daily CFR = 1.07 % was on Oct 25, 2020.

Conclusion. The highest global weekly and daily CFR was in April, 2020, when clinical trials on the use of medicines for the treatment of COVID-19 were in the initial phase [16]. The lowest weekly and daily CFR was in October, 2020, when the majority of clinical trials had already been completed, and effective therapeutic protocols had been designed and recommended for worldwide application [16, 17]. Further increase of the CFR globally and in some countries requires additional investigation.

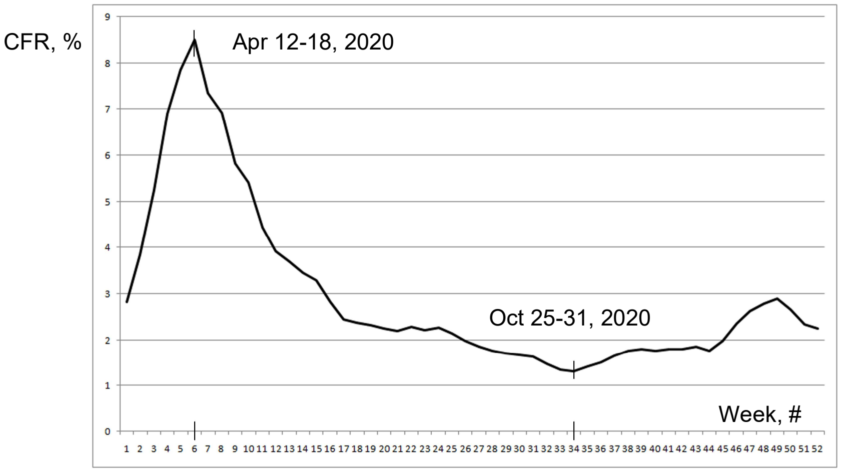

Figure 2. Dynamics of the global CFR during 52 weeks (Mar 8, 2020 – Mar 6, 2021).
In the above graph, the X axis shows the number of each week, while the Y axis shows CFR (%).

2. Infection fatality ratio among COVID-19 patients in 219 countries

Objective. To study Infection Fatality Ratio in 219 countries and to evaluate if parameters of a population age affect IFR.

2.1. *Material and Methods*. After collecting the databases, countries with fewer than 50 reported cases of deaths, countries without information on the number of tests on SARS-CoV-2 performed, and countries where the number of tests performed exceeded the total population, were excluded from the IFR study group.

The remaining 141 countries (64.38 % of 219) had a total population of 7,225,048,939 people (92.61 % of 7,801,382,128), 95,806,806 confirmed COVID-19 cases, 2,069,176 COVID-19-related deaths and 1,298,969,684 COVID-19 tests conducted.

Before estimation of an IFR, it was assumed that each person was tested only once, and the distribution of infected people among the entire population was equal. Therefore, the number of infected people was expected to increase in direct proportion to the increase in the number of new tests performed. So, to calculate the estimated number of infected people, the following formula was applied: the total number of infected individuals was derived from the number of total confirmed cases divided by the total number of tests performed and multiplied by the total population.

First, the estimated number of infected people was calculated based on the number of confirmed cases of COVID-19, the number of tests performed and the population of the country. Then, IFR was calculated by dividing the number of deaths due to COVID-19 by the estimated number of people infected with the SARS-CoV-2 virus.

Results.

Since 95,806,806 COVID-19 cases were detected after 1,298,969,684 tests, it can be expected that if the number of tests would reach the total population (n=7,225,048,939), the total number of infected people would increase to 532,890,698. Thus, the overall IFR for 141 countries would be 0.388 %.

Among 141 countries analyzed, the IFR ranged from 0.005 % in Guinea (the minimal value) to 2.575 % in the United Kingdom (the maximal value).

Based on the estimated IFR values, all the countries analyzed were divided into 13 groups, as illustrated in Figure 3.

The first and largest group with the lowest value of IFR (< 0.20%) included 67 countries. Some of the countries had quite large populations, for example, India with a total population of 1,387,530,727 people had an IFR of 0.197 %; Indonesia (275,127,290; 0.089%), Pakistan (223,256,147; 0.071%), Nigeria (208,944,590; 0.007%), Bangladesh (165,599,479; 0.032%), Japan (126,259,973; 0.066%), Ethiopia (116,527,002; 0.025%), the Philippines (110,388,276; 0.134%), etc. But other countries in this group had small populations, for example, Mayotte (276,431; 0.151%), French Polynesia (281,811; 0.067%), Cabo Verde (559,335; 0.181%), Suriname (589,549; 0.106%), Guyana (788,664; 0.139%), etc.

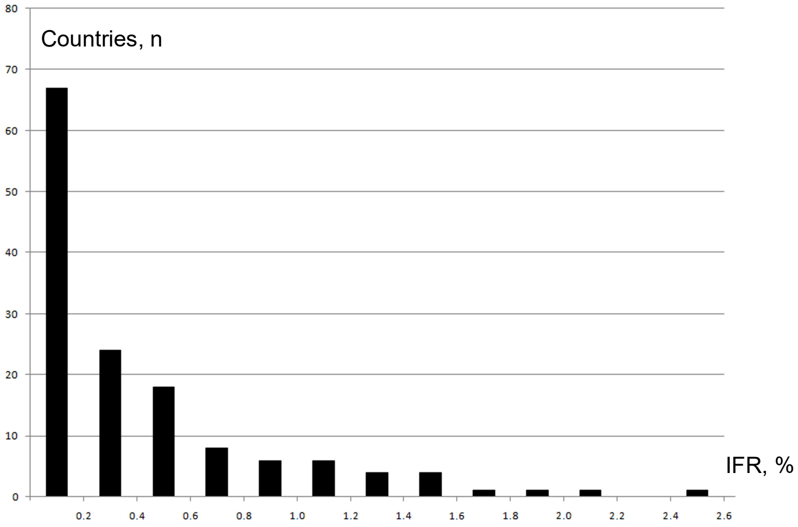

Figure 3: Distribution of 141 countries into 13 groups according to IFR value.
In the graph above, the X axis shows IFR value (%), while the Y axis shows the number of countries in the group. Group numbers: 1) IFR < 0.2%, n=67; 2) 0.2-0.4%, n=24; 3) 0.4-0.6%, n=18; 4) 0.6-0.8%, n=8; 5) 0.8-1.0%, n=6; 6) 1.0-1.2%, n=6; 7) 1.2-1.4%, n=4; 8) 1.4-1.6%, n=4; 9) 1.6-1.8%, n=1; 10) 1.8-2.0%, n=1; 11) 2.0-2.2%, n=1; 12) 2.2-2.4%, n=0; 12) IFR: 2.4-2.6%, n=1.

The groups with high values of IFR (>1.00 %) included Lithuania (1.001%), Latvia (1.016%), Hungary (1.024%), Portugal (1,050%), Germany (1.074%), Canada (1.126%), Russia (1.246%), Liechtenstein (1.247%), Greece (1.376%), Hong Kong (1.386%), the United States (1.461%), Spain (1.461%), France (1.497%), Australia (1.552%), Italy (1.716%), Belgium (1.998%), San Marino (2.128%), and the United Kingdom (2.575%).

Conclusion.

The calculations done in this section showed that in 123 out of 141 countries, the IFR was below 1.00 %, in 16 countries IFR was between 1.00 and 2.00 %, and only in 2 countries IFR was above 2.00 %. In 101 out of 141 countries IFR was less than 0.50 %.

2.2. Estimation of IFR in the 78 countries excluded from the main study

As mentioned above, countries with fewer than 50 reported cases of deaths, countries without information on the number of tests performed, and countries where the number of tests performed exceeded the total population, were excluded from the IFR study group.

Methods and Results.

Considering that IFR is always less than CFR, we can estimate the highest possible value of IFR for the countries without information on the number of tests performed (n=13), and countries where the number of tests performed exceeded the total population (n=14). In 10 out of the 27 countries of this group, both CFR and IFR were less than 1.00%, in 5 countries, CFR and IFR were between 1.00% and 2.00%, and in 12 countries, both CFR and IFR were more than 2.00%. In 5 countries of this group CFR and IFR were less than 0.50%.

In 18 out of the 78 countries, there were no reported deaths due to COVID-19, so both CFR and IFR were 0.00%.

In the remaining 33 countries with fewer than 50 reported cases of deaths, IFR was calculated in a similar manner described in section 2.2. In 32 out of 33 countries IFR was less 1.00%, and in 1 country IFR was between 1.00% and 2.00%. In 30 out of 33 countries IFR was less than 0.50%.

Conclusion.

The calculations done in the section 2.1. and 2.2. revealed that in 183 countries (83.56 % of 219) with a total population of 6,551,338,310 people (83.98 % of 7.801.382.128), IFR was less than 1.00 %, in 22 countries IFR was between 1.00% and 2.00 %, and only in 14 out of 219 countries IFR was more than 2.00 %.

In 154 out of 219 countries (70.32 % of 219) with a total population of 4,844,054,092 people (62.09% of 7.801.382.128) IFR was less than 0.50 %.

Since some of the patients were tested more than once, the real IFR values could be lower than presented in the study.

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2.3. Analysis of the effect of age on IFR among COVID-19 patients

Background. According to the database which dealt with population age, 17 out of 36 countries with IFR>1.00 % were included in the list of top 50 countries with the largest percentage of old adults [14].

Objective. To evaluate if parameters of a population age affect IFR.

Material and Methods. To study the effect of age on IFR, two parameters were used - median age and the percentage of 'aged' people [12-14]. 218 countries were divided into two groups: the first group consisted of 109 countries where IFR was less than a median value (Tunisia, IFR=0.208 %), and the second group consisted of the other 109 countries, where IFR value was more than the median value.

Results. In the first group of countries, the average value of median age was 27.06±8.05 years, and aged people were 7.00±4.88 % of the total population. In the second group, these parameters were 35.82±8.45 years and 12.93±6.82 %, respectively. There was a highly significant difference between analyzed parameters counted for both groups of countries: for median age p<0.05E-11 and for percent of aged people p<0.05E-10.

Conclusion. The calculations and analysis done in this section has revealed a correlation between IFR value and median age and percentage of aged people living in the analyzed countries: the younger population – the less value of IFR.

Discussion

In this study two main parameters of mortality from COVID-19 were estimated. As a result of the CFR calculation, countries were distributed from a minimum value of 0.17% in Qatar to a maximum value of 28.94% in Yemen. Likewise, based on IFR calculations, countries were distributed from a minimum value of 0.005% in Guinea to a maximum value of 2.575% in the United Kingdom.

For some countries, their position between minimal and maximal values of CFR and between minimal and maximal values of IFR were different. For example, Mexico (CFR=8.56%) and Yemen (CFR=28.94%) had the highest values of CFR. However, when calculating the infection fatality ratio, their IFRs (0.017% for Yemen and 0.280% for Mexico) were lower than the overall IFR for 141 countries (0.388%).

Nevertheless, other countries had low values for both IFR and CFR: in 74 out of 219 countries both parameters of mortality were less than 1.00 %, and in 38 countries they were less than 0.50 %. The latter group of countries included Malaysia with a population of 32,595,582 people, Sri Lanka (21,463,233 people), Cambodia (16,846,976 people), Burundi (12,084,506 people), UAE (9,956,592 people), Laos (7,333,942 people), Singapore (5,875,898 people), etc. 13 out of 38 countries were in Asia, 8 in North America, 7 in Oceania, 5 in Africa, 2 in Europe and 2 were in South America.

A correlation between the percentage of aged population and mortality was revealed only for IFR, but not for CFR. According to earlier publications, mortality due to COVID-19 depended on continents, countries, regions, patients' age, comorbidities, money spent on health care, therapeutic protocols used, etc. [4-5, 18-20].

Conclusion

More than a year has passed since the COVID-19 pandemic was announced. The global health care system has gone through serious trials and seemed to have emerged victorious. Under the leadership of WHO, hundreds of clinical trials have been carried out [16], which have led to the development of effective therapeutic protocols with the application of well-known medicines used successfully for many years [17].

Current estimations of both CFR and IFR have led to the conclusion that the danger of the disease caused by the new SARS-CoV-2 virus was significantly less than expected at the time of its emergence [21]. About a third of the countries analyzed have emerged as leaders in the fight against COVID-19, as they have successfully brought the fatality rate to a minimal level. In these countries, every fatal case caused by the SARS-CoV-2 was treated as a tragic exception rather than a typical outcome of a new disease. Countries which have been successful in fighting this new disease should be emulated, especially by those countries where the fight against COVID-19 has not been so successful.

Thus, this study provides an objective basis for optimism and inspires a hope for an early end to the pandemic.

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Теппоне М.

НЕДЕЛЬНЫЙ ЦИКЛ СМЕРТНОСТИ СРЕДИ ПАЦИЕНТОВ С COVID-19

Nano City Holdings Berhad, N 1, Jalan Sungai Jeluh 32/192, Shah Alam, 40460, Selangor, Malaysia

Исследован недельный цикл смертности пациентов с COVID-19. Данные о смертности, полученные с информационного портала Worldometer, проанализированы путем сравнения абсолютных цифр, процентов и t-критерия Стьюдента.

Среди жертв COVID-19 выявлено периодическое снижение смертности, соответствующее недельному циклу, причем в большинстве случаев самая низкая смертность была в воскресенье и в понедельник.

Можно предположить, что снижение смертности в воскресенье и понедельник связано с оптимальным лечебным протоколом, используемым в эти «благоприятные дни» недели. Изучение особенностей лечебных мероприятий, применявшихся в «благоприятные дни», и распространение оптимизированного протокола лечения на остальные дни недели должно сократить смертность от COVID-19 в целом.

Ключевые слова: COVID-19; пандемия; недельный цикл смертности.

Для цитирования: Теппоне М. Недельный цикл смертности среди пациентов с COVID-19. Проблемы социальной гигиены, здравоохранения и истории медицины. 2021;29(1):14—24. DOI: http://dx.doi.org/10.32687/0869-866X-2021-29-1-14-24

Для корреспонденции: Михаил Теппоне, медицинский директор, Nano City Holdings Berhad, e-mail: mikhail.teppone@gmail.com

Teppone M.

THE WEEKLY CYCLE OF MORTALITY AMONG PATIENTS WITH COVID-19

Nano City Holdings Berhad, N 1, Jalan Sungai Jeluh 32/192, Shah Alam, 40460, Selangor, Malaysia

The statistical data on mortality due to COVID-19 has been studied. The weekly cycle of mortality was established. Presumably, the decreased mortality on particular days of the week related to optimized treatment protocols applied on the «favorable days». If the factors reducing mortality on particular days of the week could be identified, their positive effect should be applied to other days of the week to decrease mortality among patients with COVID-19.

Keywords: COVID-19

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For correspondence: Teppone M., the Medical Director, Nano City Holdings Berhad. e-mail: mikhail.teppone@gmail.com

Conflict of interests. The authors declare absence of conflict of interests.

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Введение

Вспышка нового острого респираторного заболевания, вызванного вирусом SARS-CoV-2, является первой задокументированной пандемией коронавируса в истории человечества. [1] На основании анализа динамики пандемии можно предположить, что первый пациент, инфицированный SARS-CoV-2, появился в Китае примерно в октябре или ноябре 2019 г., т. е. как минимум за 1—2 мес до того как история о рынке морепродуктов в Ухане стала известной всему миру [2]. Вероятно, рынок в Ухане был не местом появления нового вируса, а местом, где вирус SARS-CoV-2 передавался от ранее инфицированных носителей к новым жертвам [3]. Согласно оценке динамики эпидемических волн, основанной на математической модели процессов распространения инфекционных заболеваний, пандемия COVID-19, вероятно, началась в августе 2019 г. [4]. Таким образом, источник SARS-CoV-2 нуждается в уточнении.

Первые диагностические тесты, позволяющие выявить людей, зараженных вирусом SARS-CoV-2, были разработаны в начале января 2020 г. [2]. С этого времени появилась уникальная возможность анализировать подробные статистические данные, относящиеся к новому заболеванию [5].

1. Подготовка к пандемии и объявление пандемии COVID-19

В первом отчете, представленном группой экспертов из Имперского колледжа в Лондоне, сообщалось о 41 подтвержденном случае COVID-19 с двумя летальными исходами. Расчетное число инфицированных приближалось к 2000 [6], следовательно, расчетная смертность составила 0,12%. Во втором отчете, представленном той же группой экспертов, было 440 подтвержденных случаев с 9 летальными исходами. Расчетное число инфицированных людей достигло 4000 [7]. Расчетная смертность от нового вируса составила 0,23%.

В январе 2020 г. в Давосе прошел 50-й Всемирный экономический форум. При обсуждении темы о новом вирусе ведущие специалисты по разработке вакцин призвали весь мир объединиться в борьбе с надвигающимся опасным заболеванием [8]. Разработчики вакцин из России поддержали своих зарубежных коллег [9].

11 марта 2020 г. Генеральный директор ВОЗ заявил: «За последние две недели число случаев заболевания COVID-19 за пределами Китая увеличилось в 13 раз, а число затронутых распространением вируса стран — втрое. <…> Поэтому мы делаем вывод, что распространение COVID-19 можно охарактеризовать как пандемию» [10].

16 марта 2020 г. Генеральный директор ВОЗ призвал все страны включиться в активное выявление зараженных SARS-CoV-2, утверждая: «Тестировать, тестировать и еще раз тестировать» [11].

За несколько часов до этого в Англии был опубликован отчет Нила Фергюсона из Императорского колледжа в Лондоне, прогозировавший высокую смертность от нового инфекционного заболевания [12]. Однако 19 августа 2020 г. правительство Англии заявило, что новый вирус не относится к особо опасным инфекционным заболеваниям [13].

Дальнейшие исследования определили уровень смертности среди людей, инфицированных SARS-CoV-2, как не превышающий 1%, который может варьировать в диапазоне 0,3—0,5% [14, 15]. Парадоксально то, что чем больше будет проведено тестов на COVID-19 и чем больше получено положительных результатов, тем меньше показатель смертности от данного заболевания, тем менее оправданно введение многочисленных ограничений. Как оказалось позже, полимеразная цепная реакция имеет множество ограничений и неточностей, снижающих диагностическую значимость этого теста [16]. По мнению экспертов Болгарской ассоциации врачей, использование полимеразной цепной реакции для диагностики COVID-19 лишено смысла и научного обоснования [17].

2. Парадоксы медицины и вызовы, предъявляемые к ней, во время пандемии COVID-19

Можно предположить, что каждый человек по мере взросления и старения, обретения жизненного опыта и профессиональных знаний, должен становиться мудрее и, следовательно, здоровее. В древности считалось, что если человек умирает в возрасте 100 лет, будучи физически здоровым, то это отражает мудрость старца и божественное благословение [18]. Однако мудрость древних не стала нормой для многих.

Анализ исторических фактов позволяет утверждать, что медицина всегда была эффективной и научной [19]. Накопленные знания прежних поколений могли бы помочь устранить любые проблемы, решенные в прошлом. Но игнорирование опыта наших предшественников приводит к тому, что количество больных не уменьшается.

Известно, что при лихорадочных заболеваниях действуют два ведущих механизма, приводящих к повышению температуры: увеличение теплопродукции и снижение теплоотдачи [20]. В Древнем Китае механизм возникновения лихорадки диагностировали на основании наличия или отсутствия жажды, потоотделения, озноба или ощущения жара, а выбор индивидуального лечения определялся типом лихорадки. Поэтому было бы логично использовать ибупрофен и парацетамол дифференцированно, с учетом их механизма лечебного действия. Тем не менее в научных статьях отсутствует рациональное объяснение назначению этих средств, но даются лишь эмпирические рекомендации по сочетанному или последовательному использованию популярных лекарств [21].

Около 1800 лет назад доктор Чжан Чжунцзин разработал общую теорию острых инфекционных заболеваний [22], которая известна современному врачу в упрощенном виде как теория общего адаптационного синдрома Ганса Селье [23]. При заболеваниях с высокой температурой, с осложненным течением, с развитием иммунодефицита и геморрагического синдрома в древности рекомендовалось использовать модифицированный вариант этой теории, важным лечебным компонентом которой являлся отвар из вайды красильной (*Isatis tinctoria*) [24]. В марте 2020 г. томские биологи уже предлагали использовать экстракт из листьев и корней вайды красильной для лечения коронавируса [25]. Высокая противовирусная и противомикробная активность этого растения была подтверждена результатами исследований, проведенных Государственным научным центром вирусологии и биотехнологии «Вектор» [26], но лекарство из вайды не попало в клиническую практику.

С начала пандемии COVID-19 было известно, что ключевым патогенетическим звеном этого заболевания, особенно у пациентов старше 65 лет, является Т-клеточный иммунодефицит, вызванный повреждением или атрофией тимуса [27—29]. Прогностически неблагоприятными признаками при COVID-19 были снижение количества лимфоцитов в целом, снижение субпопуляций Т-лимфоцитов (CD4+, CD8+) [30], нарушение функции В-лимфоцитов и дисрегуляция выработки иммуноглобулинов M и G [31]. Высказывалось опасение, что в связи с атрофией тимуса вакцинация не будет эффективной в основной группе риска, т. е. у пациентов старше 60—65 лет [32]. Поэтому было бы логично воспользоваться экстрактом из тимуса, предложенным более 130 лет назад доктором Леонардом Вулдриджем, назвавшим новый метод профилактики инфекционных заболеваний химической вакцинацией [33].

В настоящее время в Китае при иммунодефицитных состояниях используется синтетический аналог одного из гормонов тимуса (тимозин-α1). Включение тимозина-α1 в комплексное лечение больных с тяжелым течением COVID-19 привело к увеличению общего числа лимфоцитов и субпопуляций Т-лимфоцитов (CD8+, CD4+), а также к снижению смертности в группе исследования [34]. В России в течение многих лет при иммунодефицитных состояниях используются экстракты из тимуса крупного рогатого скота (тималин, Т-активин и др.) [35] и уже опубликованы первые клинические случаи эффективного применения тималина при тяжелом течении COVID-19 [36]. В марте 2020 г. в Малайзии начался подготовительный этап проекта по использованию органоспецифических нанопептидов, включая пептиды из тимуса, легких, почек и сердца, для реабилитации людей, переболевших COVID-19. Таким образом, высказываемые ранее опасения об опасности использования иммуномодуляторов при COVID-19 оказались преувеличенными [9].

3. Всемирные клинические испытания, вызванные пандемией COVID-19

С первых дней вспышки новой коронавирусной инфекции стало ясно, что стандартный подход к лечению, ориентированный на определенную болезнь, который успешно справлялся с решением задачи по стабилизации симптомов, имеющихся при хронических заболеваниях, имеет ограниченные возможности в случае появления нового острого вирусного заболевания. Это связано с тем, что *острое заболевание* не является стабильным патологическим состоянием, но имеет определенные фазы, каждая из которых требует использования определенных лекарственных средств и ухода за больным. Было бы нелогично искать лекарство для лечения COVID-19 в целом, но для лечения каждой фазы заболевания следует подбирать соответствующую группу лекарств, эффективных для исследуемой фазы, с учетом особенностей протекания заболевания у конкретного пациента.

В связи с тем что COVID-19 является *новым заболеванием*, перед здравоохранением всего мира встала задача проведения новых клинических испытаний, чтобы найти лекарственные препараты, которые были бы безопасными и эффективными в лечении COVID-19 и сопутствующих заболеваний. После объявления пандемии все пациенты, инфицированные SARS-CoV-2, были автоматически переведены в группу участников клинических испытаний, причем самых обширных за всю историю человечества. Эффективность этих испытаний можно проанализировать на основании глобальной и местной статистики.

4. Недельный цикл смертности от COVID-19

На графике ежедневной смертности от COVID-19, представленной на сайте Worldometer [5], периодическое снижение смертности в определенные дни недели отображается визуально (рис. 1). Этот цикл имеет некоторые особенности в отдельных странах [37], но его основная тенденция заключается в снижении смертности по выходным дням или дням, близким к выходным [38].

4.1. *Материалы и методы.* Обработка данных, опубликованных на сайте Worldometer, была разделена на две части: в первой части проведено изучение смертности в определенные дни недели по всему миру, во второй — в определенные дни недели в странах с наибольшей смертностью от COVID-19.

В первоначальном исследовании было проанализировано 27 нед (26.01.2020—01.08.2020). Сравнение смертности в определенные дни недели проведено в абсолютных цифрах и в процентах. Сравнение смертности между определенными днями недели проведено с использованием t-критерия Стьюдента. Если величина доверительной вероятности (p) была <0,001, например 0,0005 или 0,00005, то она представлена в результатах исследования как p<0,001.

Дополнительно использовался коэффициент высокой/низкой смертности (ВНС), получаемый от деления числа больных, умерших в день с самой высокой смертностью, на число больных, умерших в день с самой низкой смертностью.

Результаты. В течение исследуемого периода, во всем мире от COVID-19 умерли 688 250 человек: 74 698 (10,85%) умерли по воскресеньям, 76 629 (11,13%) по понедельникам, 107 694 (15,65%) по вторникам, 111 544 (16,21%) по средам, 110 028 (15,98%) по четвергам, 109 233 (15,87%) по пятницам и 98 424 (14,30%) по субботам.

Коэффициент ВНС, полученный путем деления числа людей, умерших по средам (111 544), на число людей, умерших по воскресеньям (74 698), был равен 1,493.

4.2. *Материалы и методы.* В следующем исследовании было проанализировано 18 нед (29.03.2020—01.08.2020). Ограничение периода исследования позволило частично устранить влияние изменений числа ежедневных смертей, связанных с экспоненциальным ростом смертности в начальной фазе пандемии (см. рис. 1).

Результаты. В течение исследуемого периода во всем мире от COVID-19 умерли 656 362 человека: 71 615 (10,91%) по воскресеньям, 73 406 (11,18%) по понедельникам, 103 632 (15,79%) по вторникам, 107 141 (16,32%) по средам, 105 089 (16,01%) по четвергам, 103 364 (15,75%) по пятницам и 92 115 (14,04%) по субботам (табл. 1). Коэффициент ВНС равен 1,496.

4.3. *Материалы и методы.* Сравнение глобальной суточной смертности между различными днями недели за исследуемый период

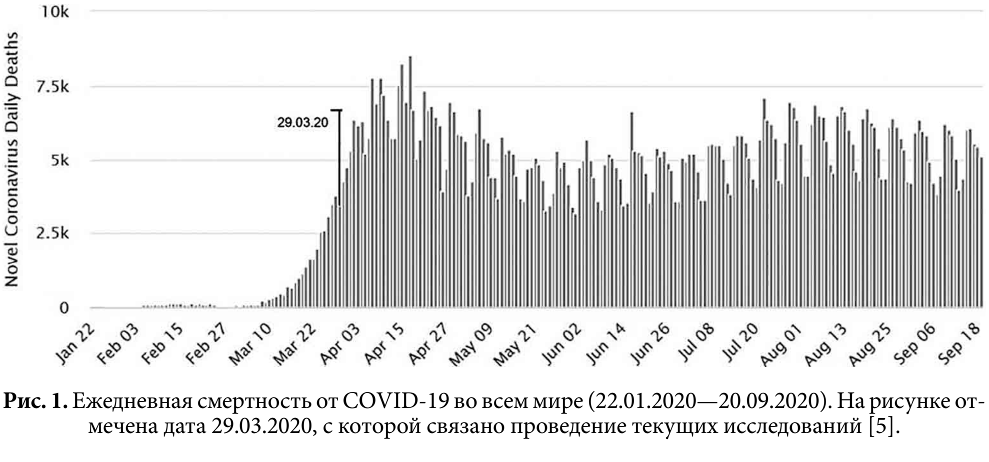

Рис. 1. Ежедневная смертность от COVID-19 во всем мире (22.01.2020—20.09.2020). На рисунке отмечена дата 29.03.2020, с которой связано проведение текущих исследований [5].

Таблица 1

Глобальная смертность от COVID-19 в разные дни недели (29.03.2020—01.08.2020)

Показатель	Всего	Воскресенье	Понедельник	Вторник	Среда	Четверг	Пятница	Суббота
n, абс.	656 362	71 615	73 406	103 632	107 141	105 089	103 364	92 115
Среднее		3979	4078	5757	5952	5838	5742	5118
SD		±695	±817	±1,084	±998	±789	±993	±829
%	100	10,91	11,18	15,79	16,32	16,01	15,75	14,04

(29.03.2020—01.08.2020) проведено с использованием *t*-критерия Стьюдента.

Результаты. Глобальная суточная смертность по воскресеньям и понедельникам была меньше глобальной суточной смертности по вторникам, средам, четвергам, пятницам и субботам; указанные различия достоверны (p<0,001).

Обсуждение. Если бы низкая смертность в воскресенье была связана с какими-либо проблемами, обусловленными регистрацией умерших больных в воскресенье, можно было бы ожидать, что все не зарегистрированные случаи умерших в воскресенье были добавлены к числу умерших в понедельник. В этом случае число умерших по понедельникам должно быть не меньше, чем в другие дни недели. Однако в действительности число смертей по понедельникам было почти таким же низким, как и по воскресеньям. Разница между количеством умерших пациентов по воскресеньям и понедельникам не достоверна (p>0,05).

Заключение. Согласно мировой статистике, для пациентов, страдающих COVID-19, самыми благоприятными днями недели были воскресенье и понедельник.

5. Недельный цикл смертности от COVID-19 в отдельных странах

Глобальная тенденция, которую можно назвать «Недельный цикл смертности», выявлена в странах с высокой смертностью от COVID-19, включая Англию, Бразилию, Германию, Мексику, Соединенные Штаты Америки, Россию и Чили.

В этих странах дни недели с самой низкой смертностью могли варьировать, но они, как правило, повторяли всемирную тенденцию и приходились на воскресенье или понедельник.

Поскольку даты появления первых больных с COVID-19 в странах различались, для каждой страны анализируемые недели также были разными. Однако все анализируемые периоды начинались с воскресенья и заканчивались субботой.

Материалы и методы. Проведено сравнение смертности от COVID-19 в определенные дни недели в отдельных странах с использованием абсолютных значений, процентов и коэффициента ВНС.

Результаты. Сравнение смертности от COVID-19 в определенные дни недели показало, что в США, Бразилии, Англии и России самая низкая смертность была по воскресеньям и понедельникам, в Мексике и Чили— по вторникам и понедельникам, в Германии — по воскресеньям и субботам. Самый высокий коэффициент ВНС наблюдался в Чили, а самый низкий — в России (табл. 2).

Заключение. Для пациентов, страдающих COVID-19, самыми благоприятными днями недели в основном были суббота, воскресенье, понедельник и вторник.

6. «Защитный эффект воскресенья» и «защитный эффект понедельника»

Среди пациентов с COVID-19 было несколько комбинаций дней с низкой смертностью, но наиболее распространенными являются воскресенье и понедельник. Это уникальное явление можно назвать «защитным эффектом воскресенья» и «защитным эффектом понедельника».

В некоторых странах анализ суточной смертности в июле 2020 г. выявляет стабильный недельный цикл с одним и тем же благоприятным днем, например воскресеньем в США (рис. 2) или понедельником в Англии (рис. 3). В других странах наиболее безопасные дни могут чередоваться, попадая или на воскресенье, или на понедельник, например в России (рис. 4).

Таблица 2

Смертность от COVID-19 в разные дни недели (данные собраны 10 августа 2020 г.)

Показатель	США	Бразилия	Мексика	Англия	Россия	Чили	Германия
Дата	29.03—01.08	26.04—01.08	19.04—01.08	29.03—01.08	26.04—01.08	17.05—01.08	29.03—23.05
Всего, абс.	155 115	89 571	46 142	44 670	13 377	8496	7933
ВНС	1,99	2,09	2,31	2,06	1,57	2,70	2,18
Воскресенье	13 825	7398	5425	4041	1499	1354	698
	8,91%	8,26%	11,76%	9,05%	11,20%	15,94%	8,80%
Понедельник	16 024	9153	3704	3646	1414	719	1165
	10,33%	10,22%	8,03%	8,16%	10,57%	8,46%	14,70%
Вторник	27 178	15 378	4598	8333	2093	552	1.337
	17,52%	17,17%	9,96%	18,65%	15,64%	6,50%	16,85%
Среда	27 525	15 161	8441	7598	2204	1360	1521
	17,74%	16,93%	18,29%	17,01%	16,48%	16,01%	19,17%
Четверг	25 638	15 498	8548	6834	1966	1490	1321
	16,53%	17,30%	18,52%	15,30%	14,70%	17,54%	16,65%
Пятница	24 302	14 423	7847	7723	2224	1448	1129
	15,67%	16,1%	17,01%	17,29%	16,63%	17,04%	14,23%
Суббота	20 623	12 560	7579	6495	1977	1573	762
	13,3%	14,02%	16,43%	14,54%	14,78%	18,51%	9,60%

6.1. «Защитный эффект воскресенья» обнаружен в США, Бразилии и Германии

Материалы и методы. Проведено сравнение суточной смертности в разные дни недели с использованием t-критерия Стьюдента.

США (29.03.2020—01.08.2020): по воскресеньям суточная смертность меньше, чем по вторникам, средам (p<0,001), четвергам, пятницам (p<0,005) и субботам (p<0,05). По понедельникам суточная смертность меньше, чем по средам (p<0,005), вторникам, четвергам (p<0,01) и пятницам (p<0,05).

Бразилия (26.04.2020—01.08.2020): по воскресеньям суточная смертность меньше, чем по вторникам, средам, четвергам, пятницам, субботам (p<0,001) и понедельникам (p<0,05). По понедельникам суточная смертность меньше, чем по вторникам, средам, четвергам, пятницам (p<0,001) и субботам (p<0,05).

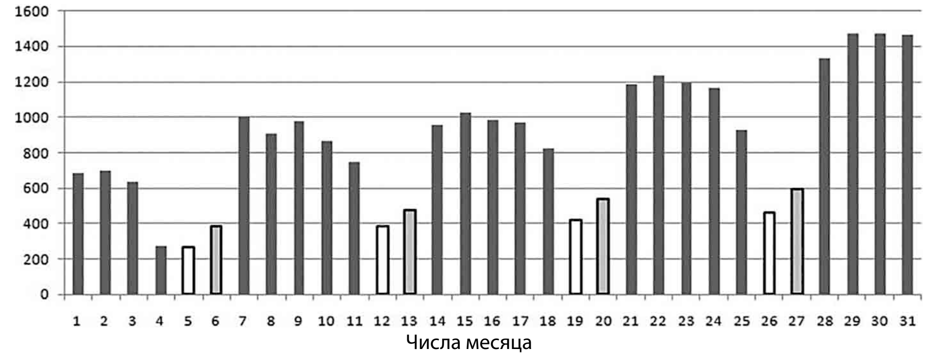

Рис. 2. Смертность от COVID-19 (в абс. ед.) в разные дни недели в США в июле 2020 г.

Здесь и на рис. 3, 4: белые столбики — воскресенье, серые — понедельник, черные— вторник, среда, четверг, пятница и суббота последовательно.

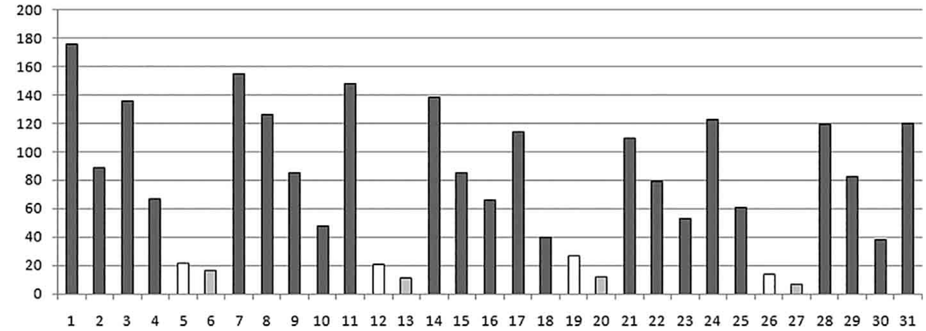

Рис. 3. Смертность от COVID-19 (в абс. ед.) в разные дни недели в Англии в июле 2020 г.

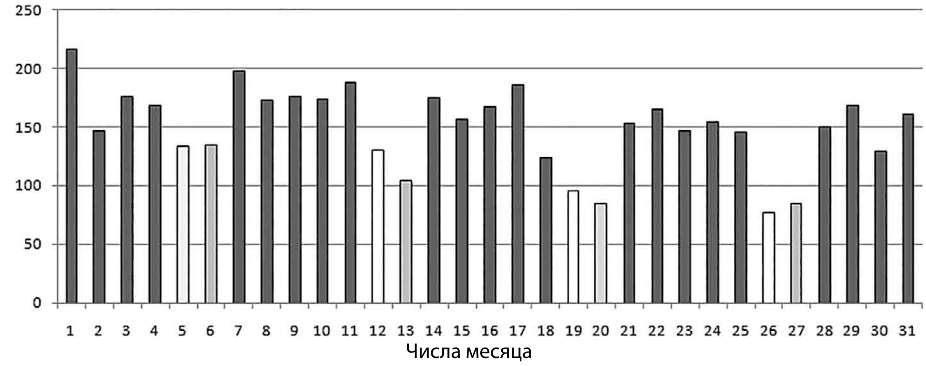

Рис. 4. Смертность от COVID-19 (в абс. ед.) в разные дни недели в России в июле 2020 г.

Германия (29.03.2020—23.05.2020): по воскресеньям суточная смертность меньше, чем по понедельникам, вторникам, средам и четвергам (p<0,05). По субботам суточная смертность меньше, чем по средам (p<0,05).

6.2. «Защитный эффект понедельника» обнаружен в Англии, Мексике, России

Материалы и методы. Проведено сравнение суточной смертности в разные дни недели с использованием t-критерия Стьюдента.

Результаты. Англия (29.03.2020—01.08.2020): по понедельникам суточная смертность меньше, чем по вторникам, средам и пятницам (p<0,05). По воскресеньям суточная смертность меньше, чем по вторникам и средам (p<0,05).

Мексика (19.04.2020—01.08.2020): по понедельникам суточная смертность меньше, чем по средам, четвергам, пятницам и субботам (p<0,005). По вторникам суточная смертность меньше, чем по средам, четвергам, пятницам и субботам (p<0,05). По воскресеньям суточная смертность меньше, чем по средам и четвергам (p<0,05).

Россия (26.04.2020—01.08.2020): по понедельникам суточная смертность меньше, чем по вторникам, средам, пятницам (p<0,001), четвергам (p<0,005) и субботам (p<0,05). По воскресеньям суточная смертность меньше, чем по средам, пятницам (p<0,001), вторникам (p<0,005), четвергам и субботам (p<0,05).

Чили (10.05.2020—01.08.2020): по вторникам суточная смертность меньше, чем по воскресеньям, средам, четвергам, пятницам и субботам (p<0,05). По понедельникам суточная смертность меньше, чем по воскресеньям, четвергам, пятницам и субботам (p<0,05).

Заключение. Недельный цикл смертности был обнаружен в Англии, Бразилии, Германии, Мексике, России, США и Чили. В большинстве из этих стран для пациентов, страдающих COVID-19, самыми благоприятными днями недели были воскресенье и понедельник. В Чили и в Мексике самыми благоприятными днями недели были понедельник и вторник, в Германии — суббота и воскресенье. (см. табл. 2).

7. Недельный цикл смертности в некоторых штатах США

Введение. В связи с тем что в США было наибольшее количество смертей, связанных с COVID-19 [39], проведен дополнительный анализ недельного цикла смертности в штатах с высокой смертностью, включая Аризону, Джорджию, Иллинойс, Калифорнию, Коннектикут, Луизиану, Массачусетс, Мичиган, Нью-Джерси, Нью-Йорк, Огайо, Пенсильванию, Техас и Флориду (табл. 3).

Материалы и методы. Проведены сравнение общей смертности в определенные дни недели в абсолютных значениях и в процентах, а также расчет ВНС и сравнение суточной смертности в разные дни недели с использованием *t*-критерия Стьюдента. Анализируемый период — с 29 марта по 1 августа 2020 г.

Результаты. В Соединенных Штатах в целом самыми благоприятными днями для больных COVID-19 были воскресенье и понедельник. В отдельных штатах среди самых благоприятных дней были воскресенье, понедельник или суббота. Самые высокие коэффициенты ВНС выявлены в штатах Аризона, Джорджия и Техас.

Достоверные различия по числу смертей в разные дни недели с использованием *t*-критерия Стьюдента выявлены в штатах Аризона, Джорджия, Иллинойс, Калифорния, Луизиана, Мичиган, Нью-Джерси, Огайо, Пенсильвания, Техас и Флорида ($p<0{,}05$).

Заключение. Недельный цикл смертности был обнаружен в США в целом и в отдельных штатах. В большинстве штатов для пациентов, страдающих COVID-19, самыми благоприятными днями недели были воскресенье, понедельник и суббота.

8. Страны с неподтвержденным недельным циклом смертности от COVID-19

В Бельгии, Индии, Иране, Испании, Италии, Канаде, Китае, Колумбии, Нидерландах, Перу, Франции, Швеции и в Южной Африке разница в суточной смертности между определенными днями недели была недостоверной ($p>0{,}05$). Тем не менее в большинстве исследуемых стран дни с наименьшей смертностью приходились на воскресенье или понедельник.

Таблица 3

Смертность от COVID-19 в разных штатах США (29.03—01.08 2020 г.)

Показатель	США	Нью-Йорк	Пенсильвания	Техас	Джорджия	Аризона
Всего	155 115	31 358	7246	7234	3746	3716
ВНС	1,99	1,26	3,73	3,16	5,87	8,28
Воскресенье	13 825	4462	414	439	138	207
	8,91%	14,23%	5,71%	6,07%	3,68%	5,57%
Понедельник	16 024	4351	518	626	581	89
	10,33%	13,88%	7,15%	8,65%	15,51%	2,4%
Вторник	27 178	5067	1391	1117	810	737
	17,52%	16,16%	19,20%	15,44%	21,62%	19,83%
Среда	27 525	5034	1545	1388	671	672
	17,74%	16,05%	21,32%	19,19%	17,91%	18,08%
Четверг	25 638	4140	1376	1365	571	673
	16,53%	13,20%	18,99%	18,87%	15,25%	18,11%
Пятница	24 302	4298	1142	1299	649	629
	15,67%	13,71%	15,76%	17,96%	17,33%	16,93%
Суббота	20 623	4006	860	1000	326	709
	13,3%	12,77%	11,87%	13,82%	8,70%	19,08%

Наиболее высокие коэффициенты ВНС выявлены во Франции (2,21), Нидерландах (2,04), Южной Африке (1,68) и Бельгии (1,48), а самые низкие — в Иране (1,09), Перу (1,13), Испании (1,15) и Китае (1,2).

9. Влияние обновления базы данных на недельный цикл смертности от COVID-19

Во время текущего наблюдения (01.07.2020—20.09.2020), статистические данные о смертности от COVID-19, публикуемые на сайте Worldometer, постоянно обновлялись. Обновление касалось не только текущих дней, но и прошлых. В некоторых странах данные о смертности, относящиеся к прошлым дням, были стабильными, в других изменения происходили постоянно, каждые 5—7 дней, причем как вверх, так и вниз.

Цель исследования — изучить влияние обновления базы данных на недельный цикл смертности от COVID-19.

9.1. *Материалы и методы.* Чтобы узнать, как влияет корректировка данных за прошлые дни на результаты текущего исследования, данные по смертности от COVID-19 были собраны вновь 20 сентября 2020 г.

Было проведено сравнение общей смертности в определенные дни недели в абсолютных значениях и процентах, проведен расчет ВНС и сравнение суточной смертности между различными днями недели с использованием *t*-критерия Стьюдента. В анализ были включены 34 недели (26.01.2020—19.09.2020).

Результаты. В течение исследуемого периода во всем мире от COVID-19 умерли 960 727 больных: 106 501 (11,09%) по воскресеньям, 107 847 (11,23%) по понедельникам, 149 308 (15,54%) по вторникам, 156 738 (16,31%) по средам, 153 816 (16,01%) по четвергам, 150 766 (15,69%) по пятницам и 135 751 (14,13%) по субботам (рис. 5). Коэффициент ВНС равен 1,47.

Глобальная суточная смертность по воскресеньям и понедельникам была меньше, чем по вторникам, средам, четвергам и пятницам ($p<0{,}05$). Если анализировать только последние 25 нед, то глобальная суточная смертность по воскресеньям и понедельникам оказывается меньше, чем по вторникам, средам, четвергам, пятницам и субботам ($p<0{,}00005$).

Заключение. Обновление базы данных глобальной смертности от COVID-19, относящейся к прошлым и текущим дням, не повлияло на недельный цикл смертности от COVID-19.

9.2. *Материалы и методы.* Чтобы изучить влияние обновления базы данных за прошлые дни на результаты текущего исследования, проведено сравнение данных за 23 нед (26.01.2020—04.07.2020), собран-

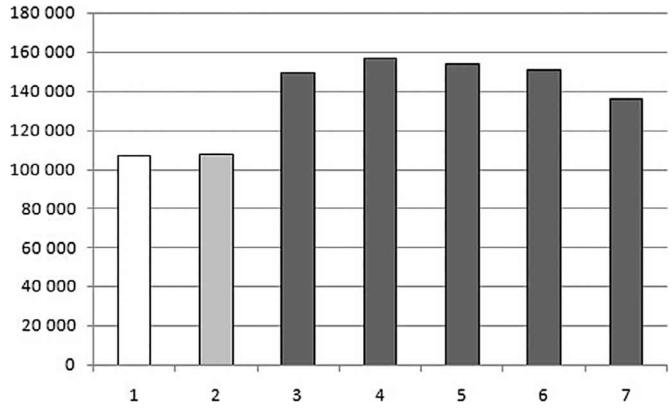

Рис. 5. Глобальная смертность от COVID-19 (в абс. ед.) в разные дни недели (26.01.2020—19.09.2020).

1 — воскресенье, 2 — понедельник, 3 — вторник, 4 —среда, 5 — четверг, 6 — пятница, 7 — суббота.

ных по разным датам, включая 6 и 12 июля, 2, 6, 17, 27 августа и 3, 7, 9, 15, 18 и 20 сентября 2020 г. (табл. 4).

Результаты. В ходе исследования общее число смертей, относящихся к периоду с 26 января по 4 июля 2020 г., было не постоянным. Наблюдается как увеличение цифр общей смерти от COVID-19, так и снижение. Очередность дней недели от низкой смертности к высокой остается почти неизменной: воскресенье < понедельник < суббота < вторник < пятница < среда < четверг. Коэффициент ВНС имеет тенденцию к снижению.

9.3. *Материалы и методы.* Чтобы изучить влияние обновления базы данных за прошлые дни на результаты текущего исследования, проведено дополнительное сравнение данных за более поздние сроки пандемии (18 нед: 29.03.2020—01.08.2020), собранных по разным датам, включая 2, 6, 17, 27 августа и 3, 7, 9, 15, 18 и 20 сентября 2020 г. (табл. 5).

Результаты. В ходе исследования общее число смертей, относящихся к периоду с 29 марта по 1 августа 2020 г., было непостоянным. Наблюдается как увеличение цифр общей смерти от COVID-19, так и снижение. Очередность дней недели от низкой смертности к высокой остается неизменной: воскресенье < понедельник < суббота < пятница < вторник < четверг < среда. Коэффициент ВНС имеет тенденцию к снижению.

Заключение. Обновление базы данных глобальной смертности от COVID-19, относящейся к прошлым дням, не повлияло на недельный цикл смертности от COVID-19 в целом. Изменение числа смертей за прошлые даты, особенно их снижение, нуждается в дополнительном исследовании.

9.4. *Методы.* Чтобы изучить влияние обновления базы данных за прошлые дни на недельный цикл смертности в странах, которые были проанализированы ранее, данные по ним были собраны повторно 10 сентября 2020 г. Было проведено сравнение общей смертности, а также суточной смертности в определенные дни недели в абсолютных значениях и

Таблица 4

Глобальная смертность от COVID-19 за 23 нед (26.01.2020—04.07.2020), на основании информации, собранной по разным датам

Дата	Всего	±Δ	Воскресенье	Понедельник	Вторник	Среда	Четверг	Пятница	Суббота	ВНС
06.07	532 817		57 351	60 200	84 380	85 075	85 151	84 617	76 043	1,485
12.07	532 972	+155	57 360	60 208	84 401	85 093	85 181	84 641	76 088	1,485
02.08	536 657	+3685	57 872	60 643	84 891	85 679	85 674	85 226	76 672	1,480
06.08	537 221	+564	57 947	60 712	84 954	85 740	85 801	85 304	76 763	1,481
17.08	539 314	+2657	58 575	61 464	85 213	85 703	86 085	85 385	76 889	1,470
27.08	538 730	−584	58 719	61 708	84 941	85 420	86 050	84 985	76 907	1,465
03.09	538 718	−12	58 719	61 708	84 941	85 420	86 038	84 985	76 907	1,465
07.09	541 679	+2961	59 242	61 935	85 405	85 723	86 357	85.641	77 376	1,458
09.09	541 679	0	59 242	61 935	85 405	85 723	86 357	85 641	77 376	1,458
15.09	541 679	0	59 242	61 935	85 405	85 723	86 357	85 641	77 376	1,458
18.09	541 709	+30	59 244	61 936	85 411	85 729	86 362	85 645	77 382	1,458
20.09	541 709	0	59 244	61 936	85 411	85 729	86 362	85 645	77 382	1,458

Примечание. Даны цифры общей смертности, изменение цифр общей смертности при сравнении с предыдущей датой (±Δ), цифры глобальной смертности в разные дни недели и коэффициент ВНС.

Таблица 5

Глобальная смертность от COVID-19 за 18 нед (29.03.2020—01.08.2020) на основании информации, собранной в разные даты

Дата	Всего	±Δ	Воскресенье	Понедельник	Вторник	Среда	Четверг	Пятница	Суббота	ВНС
02.08	655 799		71 540	73 337	10 3569	10 7080	10 4963	10 3286	92 024	1,497
06.08	656 362	+563	71 615	73 406	10 3632	10 7141	10 5089	10 3364	92 115	1,496
17.08	655 904	−458	72 038	73 964	10 3294	10 6701	10 5038	10 3032	91 837	1,481
27.08	654 940	−964	72 086	74 127	10 2928	10 6335	10 5270	10 2532	91 662	1,475
03.09	654 917	−3	72 084	74 127	10 2929	10 6334	10 5255	10 2528	91 660	1,475
07.09	658 879	+3962	72 707	74 454	10 3579	10 6765	10 5714	10 3343	92 317	1,469
09.09	658 879	0	72 707	74 454	10 3579	10 6765	10 5714	10 3343	92 317	1,469
15.09	658 879	0	72 707	74 454	10 3579	10 6765	10 5714	10 3343	92 317	1,469
18.09	658 938	+59	72 709	74 458	10 3593	10 6775	10 5723	10 3353	92 327	1,469
20.09	658 938	0	72 709	74 458	10 3593	10 6775	10 5723	10 3353	92 327	1,469

Примечание. Даны цифры обшей глобальной смертности, изменение цифр общей смертности при сравнении с предыдущей датой (±Δ), цифры глобальной смертности в разные дни неделии коэффициент ВНС.

Таблица 6

Значения общей смертности от COVID-19 за исследуемые периоды в разных странах, а также изменение значений смертности (±Δ) и цифры смертности в разные дни недели (данные собраны 10 сентября 2020 г.)

Показатель	США	Бразилия	Мексика	Англия	Россия	Чили	Германия
Дата	29.03—01.08	26.04—01.08	29.03—01.08	19.04—01.08	26.04—01.08	17.05—01.08	29.03—23.05
Всего, абс.	155 399	89 571	46 142	39 745	13 377	8496	7933
±Δ	+284	0	0	−4925	0	0	0
Воскресенье	13 827	7398	5.425	3737	1499	1354	698
	8,90%	8,26%	11,76%	9,40%	11,20%	15,94%	8,80%
Понедельник	16 028	9153	3.704	3524	1414	719	1165
	10,31%	10,22%	8,03%	8,87%	10,57%	8,46%	14,70%
Вторник	27 180	15 378	4.598	7187	2093	552	1337
	17,49%	17,17%	9,96%	18,08%	15,64%	6,50%	16,85%
Среда	27 525	15 161	8.441	6745	2204	1360	1521
	17,71%	16,93%	18,29%	16,97%	16,48%	16,01%	19,17%
Четверг	26 015	15 498	8.548	6147	1966	1490	1321
	16,74%	17,30%	18,52%	15,47%	14,70%	17,54%	16,65%
Пятница	24 289	14 423	7.847	6726	2224	1448	1129
	15,63%	16,1%	17,01%	16,92%	16,63%	17,04%	14,23%
Суббота	20 535	12 560	7579	5679	1977	1573	762
	13,22%	14,02%	16,43%	14,29%	14,78%	18,51%	9,60%

в процентах (табл. 6). Затем было проведено сравнение новых результатов с результатами, полученными 10 августа 2020 г. (см. табл. 3), разница представлена в табл. 6 как ±Δ.

Результаты. Данные по общей смертности от COVID-19, относящиеся к Бразилии, России, Чили и Германии, остались без изменений.

В США общее число смертей за исследуемый период (29.03.2020—01.08.2020) увеличилось на 284. Величина коэффициента ВНС и день с минимальной суточной смертностью не изменились. Достоверность различий между ежедневной смертностью по воскресеньям и четвергам увеличилась, при этом величина доверительной вероятности (p) снизилась с $p<0{,}005$ до $p<0{,}001$.

В Англии общее количество смертей, относящихся к периоду 29.03.2020—01.08.2020, уменьшилось на 4925. После обновления данных коэффициент ВНС уменьшился с 2,06 до 2,04, а различие в суточной смертности в разные дни недели стало недостоверным ($p>0{,}05$). Понедельник остался днем с самой низкой смертностью (рис. 6).

Среди стран, анализируемых в разделе 8, изменения в базе данных произошли в Перу [+4064], Италии [+152], Нидерландах [+125], Франции [−24], Иране [−37] и Бельгии [+9].

После анализа базы данных, собранной 10 сентября 2020 г., недельный цикл смертности был выявлен в Аргентине. За 22 нед (05.04.2020—05.09.2020) по воскресеньям дневная смертность была меньше, чем по вторникам, средам, четвергам и пятницам ($p<0{,}05$). Коэффициент ВНС равен 2,31.

Заключение. Изменение базы данных общей и локальной смертности от COVID-19, относящейся к прошлым датам, не повлияло на недельный цикл смертности в целом, хотя привело к изменению результатов исследования в отдельных странах. Требуются дополнительные исследования, чтобы выявить причину изменения числа смертей, связанных с прошлыми датами.

После сбора новых данных (9—11 декабря 2020 г.) недельный цикл был впервые выявлен или подтвержден в следующих странах: Англии, Аргентине, Бразилии, Германии, Мексике, Нидерландах, Польше, России, Соединенных Штатах Америки, Украине, Франции и Чили. В США недельный цикл был выявлен или подтвержден в 23 штатах (Алабама, Аризона, Вирджиния, Висконсин, Джорджия, Иллинойс, Индиана, Калифорния, Луизиана, Массачусетс, Миннесота, Миссисипи, Миссури, Мичиган, Мэриленд, Нью-Джерси, Огайо, Пенсильвания, Северная и Южная Каролина, Теннесси, Техас, Флорида). Во всех перечисленных странах и штатах различия по количеству умерших в разные дни недели достоверны ($p<0{,}05$—$p<0{,}001$ и менее).

10. Недельный цикл не имеет природной основы

В XVIII в. Антуан-Ив Гоге писал: «В качестве первого шага, который предприняли люди для определения времени, было выделение небольшого периода из семи дней, называемого неделей. Мы видим,

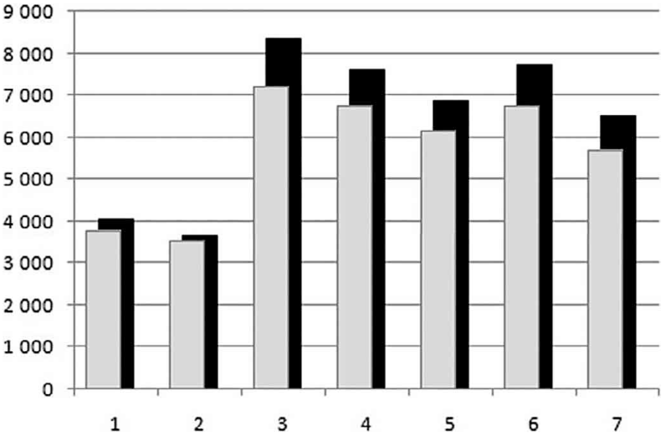

Рис. 6. Смертность от COVID-19 (в абс. ед.) в разные дни недели в Англии (29.03.2020—01.08.2020). Сравнение базы данных, собранных 10 августа (черный цвет) и 10 сентября (серый цвет). Число смертей за исследуемый период уменьшилось на 4925 человек.

1 — воскресенье (−304), 2 — понедельник (−122), 3 —вторник (−1146), 4 — среда (−853), 5 —четверг (−687), 6— пятница (−997), 7 — суббота (−816).

что с незапамятных времен неделя использовалась повсеместно, а ее характеристики везде были одинаковыми» [40].

Джозеф Нидэм, отражая современный взгляд на календарь, объясняет, что некоторые из его элементов основаны на естественных астрономических циклах, которые очевидны и важны в жизни людей, к ним относятся день, месяц и год. Другие имеют искусственное происхождение, например семидневная неделя и деление дня на часы [41]. Эвиатар Зерубавель, описывая особенности недельного цикла, назвал свою книгу «Скрытые ритмы» [42].

10. Обсуждение

С одной стороны, неделя как форма определения времени существует, но с другой — нет никакой естественной основы, объясняющей недельную цикличность.

В данном исследовании при изучении смертности от COVID-19 был обнаружен недельный цикл с тенденцией к снижению смертности по воскресеньям и понедельникам, что является уникальным явлением в медицинской практике.

Описываемый цикл имеет противоположную характеристику по сравнению с той, которую наблюдали в Англии в 2015 г., когда по выходным дням больничная смертность увеличивалась [43].

По мнению д-ра мед. наук, профессора И. А. Гундарова, причина недельного цикла смертности заключается в том, что лечение больных с COVID-19 все еще находится в фазе клинических испытаний, а смертность в этой группе коррелирует с избыточной лечебной активностью, которая снижается в выходные дни [44].

11. Заключение

В связи со снижением смертности по воскресеньям, понедельникам и некоторым другим «благоприятным дням» недели, представляется целесообразным изучение факторов, лежащих в основе этих «безопасных дней».

Благоприятные факторы могут быть связаны с различными аспектами здравоохранения, включая протоколы лечения и график работы медицинского персонала, или могут относиться к человеческим привычкам и традициям. Предположительно, они связаны с оптимизированными лечебными протоколами, используемыми в «безопасные дни» недели.

Если факторы, снижающие смертность в определенные дни недели, будут выявлены, то их положительный эффект может быть распространен на другие дни. В результате оптимизации лечения жизнь многих пациентов с COVID-19 может быть сохранена.

Автор выражает благодарность своим коллегам из Бразилии, Китая, Италии, Малайзии и США, которые поделились терапевтическими протоколами, применяемыми в их больницах для пациентов с COVID-19.

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Автор заявляет об отсутствии конфликта интересов в представленной рукописи.

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A UNIQUE PHENOMENON OF THE PANDEMIC 2020:[*]
Mortality among COVID-19 Patients is the Lowest on Sundays and Mondays.

Dr. Mikhail Teppone.

Dr. Mikhail Teppone,
Orcid N: 0000-0002-5366-3188
Medical Director, Nano City Holdings Berhad,
No. 1, Jalan Sungai Jeluh 32/192,
Shah Alam, 40460, Selangor, Malaysia.
Email: mikhail.teppone@gmail.com

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Abstract.

Background. The Weekly Mortality Cycle among CoViD-19 patients has been studied.

Methods. Mortality data obtained from the 'Worldometer' website were analyzed with a comparison of absolute values, percentages and p-value.

Results. For patients suffering from CoViD-19, the most favorable or the safest days of the week were Sundays and Mondays.

Conclusion. The weekly cycle with decreased mortality on Sundays and Mondays is a unique phenomenon observed among victims of CoViD-19. Presumably the decreased mortality on certain days of the week was related to the optimized therapeutic protocols used on the "safest days". If the factors, which reduced mortality on certain days of the week could be identified, their positive effect should be spread to other days of the week to decrease mortality among patients suffering from CoViD-19.

Keywords. CoViD-19, Mortality, Weekly Cycle, Weekly Mortality Cycle, Pandemic.

Abbreviation. HLM – is a ratio between a number of deaths on the day with the highest mortality and a number of deaths on the day with the lowest mortality.

Abbreviations for the days of the week were used in all tables and in the certain places of the main text: 'Sun' means Sunday(s), 'Mon' – Monday/s, 'Tue' – Tuesday/s, 'Wed' – Wednesday/s, 'Thu' - Thursday/s, 'Fri' – Friday/s and 'Sat' – Saturday/s.

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[*] Professor Igor A. Gundarov, a Doctor of Medicine, a specialist in the field of epidemiology and medical statistics, comments this study at the Section # 11.

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Introduction.

On December 31, 2019, Wuhan Municipal Health Commission announced a pneumonia epidemic.[1] On the same day the WHO's China Country Office was informed of the cases of pneumonia of unknown cause detected in Wuhan City, Hubei Province of China.[2]

On January 3, 2020, the first complete genome of the novel coronavirus (2019-nCoVs) was identified. Several detection tests have been developed by Chinese Center for Disease Control and Prevention.[3] On February 11, 2020, a new disease was named "the coronavirus disease 2019" or CoViD-19.[4] On March 11, 2020, World Health Organization declared CoViD-19 pandemic.[5]

1. Mortality Among People Infected with SARS-CoV-2 and its Dynamic.

Mortality rate is one of the most important parameters of any infectious disease. So, collection of the date dealing with the current pandemic should be done with great care otherwise coronavirus mortality overestimation can lead to wrong decisions.[6]

In the first report provided by a group of experts from Imperial College London, there were 41 confirmed cases with 2 deaths; the estimated number of infected people was 1,723,[7] (the estimated mortality rate was around - 0.12 %). In the second report provided by the same group of experts, there were 440 confirmed cases with 9 deaths, and the estimated number of infected people was around 4000,[8] (the estimated mortality rate was around - 0.23 %). The most pessimistic prognosis was predicted by the same group of scientists on March 18, 2020.[9]

According to the subsequent studies, the mortality rate among SARS-CoV-2 infected people was less than 1 %,[10] and could vary around 0.3-0.5 %.[11]

Objective: To study the dynamic of weekly mortality rate among people infected with SARS-CoV-2.

Methods: The database of the "Worldwide Daily Mortality" due to CoViD-19 was collected from the 'Worldometer' website[12] on December 7, 2020, and then presented in Table. 1. The database of the "Worldwide Daily New Cases" infected with SARS-CoV-2 were collected from the same source, but that table was omitted in the manuscript. Forty weeks were analysed (01.03.30–05.12.20).

For each week, weekly mortality and weekly new cases were calculated using simple addition of data for seven days, from Sunday to Saturday. Weekly mortality rate was estimated with dividing "weekly mortality" by "weekly new cases" for each week (Tab. 2). The dynamics of weekly mortality is shown in Figure 1.

Results: According to the current study, the highest mortality was observed from the mid of March to the mid of May, with the highest rate (9.36%) during the week No. 7 (April 12-18), when the clinical trials in the group of people infected with SARS-CoV-2 were in the initial phase yet.

Table 1.
Global Mortality Due to CoViD-19 from January 24 to December 5, 2020 [collected on December 7, 2020].

week, #	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Comments	HLR
						**16	15	** Jan 24	
i	24	26	26	38	43	46	*45	* Feb 1	1.917
ii	58	64	66	73	73	86	89		1.534
iii	97	108	97	146	122	143	143		1.505
iv	106	98	136	117	121	113	100		1.388
v	158	81	64	37	58	65	54		4.270
No. 1	*73	67	85	83	102	106	106	* Mar 1	1.582
2	229	197	277	333	358	452	421		2.294
3	708	655	837	1001	1126	1417	1666		2.544
4	1690	1998	2586	2642	3118	3551	3847		2.276
5	3498	4289	4754	*5349	6400	6197	6307	* Apr 1	1.830
6	5260	5761	7839	6928	7822	7246	6405		1.490
7	5772	5786	7552	8263	7016	8534	6701		1.479
8	5045	5740	7362	6697	6862	6487	6223		1.459
9	3945	4701	7000	6675	5909	*5884	5665	* May 1	1.774
10	3807	4307	5950	6773	5773	5634	4428		1.779
11	4447	3700	5765	5269	5402	5234	4477		1.558
12	3717	3616	4712	4764	5139	4887	4333		1.421
13	3312	3516	3900	5365	4783	4968	4212		1.620
14	3444	*3239	4779	5024	5749	5040	4455	* Jun 1	1.775
15	3670	3350	4866	5280	5139	4789	4431		1.576
16	3502	3599	6665	5386	5367	5252	4599		1.903
17	3595	4039	5486	5208	5398	4977	4726		1.526
18	3684	3694	5142	*4969	5299	5310	4707	* Jul 1	1.441
19	3782	3692	5602	5696	5654	5602	5150		1.543
20	4380	3920	5682	5980	5967	5762	5252		1.526
21	4478	4123	5827	7314	6479	6356	5848		1.774
22	4445	4253	5680	7073	6839	6493	*5717	* Aug 1	1.663
23	4577	4470	6341	7049	6644	6602	5771		1.577
24	4929	4540	6513	6921	6720	6128	5675		1.524
25	4706	4405	6335	6779	6357	6213	5547		1.539
26	4598	4325	6202	6466	6223	5837	5497		1.495
27	4353	4346	*5978	6457	6004	5863	5003	* Sep 1	1.486
28	4247	3872	4429	6230	6021	5792	5116		1.609
29	4002	4264	6000	6007	5412	5453	5200		1.501
30	3992	3810	5364	6048	5558	5462	5101		1.587
31	3795	3536	5498	5836	*5623	5622	4874	* Oct 1	1.650
32	4123	4270	5576	5938	6431	5894	5267		1.560
33	3974	3782	5002	6101	6119	6226	5720		1.646
34	4110	4440	6190	6856	6502	6555	5747		1.668
35	4659	5113	7055	7167	7170	7521	6665		1.614
36	*5480	5761	8250	9182	8869	9260	7722	* Nov 1	1.690
37	6129	6748	9358	10193	9687	10003	9226		1.663
38	7117	7629	10578	11283	11068	11169	9332		1.585
39	7829	8170	11786	12286	11281	10832	9523		1.569
No. 40	7585	8462	*11943	12516	12834	12166	10191	* Dec 1	1.692

* A first day of each month.
** January 24, 2020 was the first day mentioned in the database of the 'Worldometer' website.

Table 2.
Weekly deaths, weekly new cases and mortality rate; Forty weeks were analysed (01.03.20-05.12.20).

Week Number and dates		Weekly Deaths	Weekly New Cases	*MR
1	01.03-07.03	622	27030	2.30
2	08.03-14.03	2267	80847	2.80
3	15.03-21.03	7410	192895	3.84
4	22.03-28.03	19432	359549	5.40
5	29.03-04.04	36794	502534	7.32
6	05.04-11.04	47261	550941	8.58
7	**12.04-18.04**	**49624**	**530089**	**9.36**
8	19.04-25.04	44416	558829	7.95
9	26.04-02.05	39779	545512	7.29
10	03.05-09.05	36672	606805	6.04
11	10.05-16.05	34294	615151	5.57
12	17.05-23.05	31168	688057	4.53
13	24.05-30.05	30056	769786	3.90
14	31.05-06.06	31730	844284	3.76
15	07.06-13.06	31525	902187	3.49
16	14.06-20.06	34370	1026292	3.35
17	21.06-27.06	33429	1170067	2.86
18	28.06-04.07	32805	1330213	2.47
19	05.07-11.07	35178	1464504	2.40
20	12.07-18.07	36943	1581194	2.34
21	19.07-25.07	40425	1788346	2.26
22	26.07-01.08	40500	1831624	2.21
23	02.08-08.08	41454	1800749	2.30
24	09.08-15.08	41426	1853586	2.23
25	16.08-22.08	40342	1771117	2.28
26	23.08-29.08	39148	1808783	2.16
27	30.08-05.09	38004	1911797	1.99
28	06.09-12.09	35707	1904865	1.87
29	13.09-19.09	36338	2043230	1.78
30	20.09-26.09	35335	2042437	1.73
31	27.09-03.10	34784	2072676	1.68
32	04.10-10.10	37499	2290257	1.64
33	11.10-17.10	36924	2491069	1.48
34	18.10-24.10	40400	2979525	1.36
35	25.10-31.10	45350	3438119	1.32
36	01.11-07.11	54524	3874278	1.41
37	18.11-14.11	61344	4074584	1.51
38	15.11-21.11	68176	4109382	1.66
39	22.11-28.11	71707	4072184	1.76
40	29.11-05.12	75697	4256119	1.78

* Mortality rate was calculated as the ratio between the number of "Weekly Deaths" and the number of "Weekly New Cases"; it is expressed in percentage.

Conclusion: There are no valid publications that have revealed change in the danger of a new virus. Therefore, one can assume that the dynamic of the mortality rate among patients with CoViD-19 (Fig. 1) depended on the treatment efficacy. Based on the previous estimation offered by a group of experts from Imperial College London[7] it may be concluded that a real amount of the infected people much higher than recorded and a real mortality rate is lower than was estimated in Tab. 2.

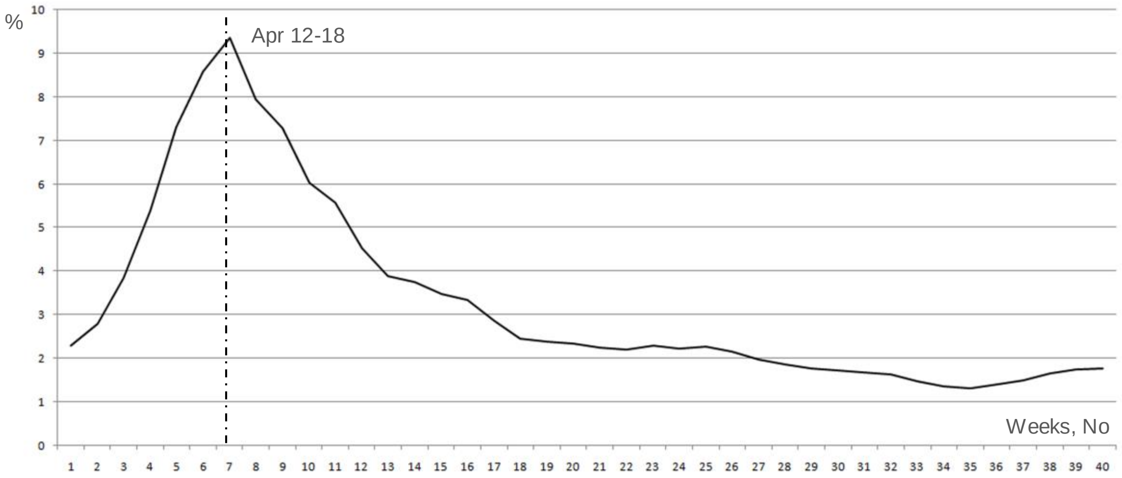

Figure 1. Weekly mortality rate calculated as a ratio between the total sum of weekly deaths due to CoViD-19 and the total sum of the weekly new cases infected with SARS-CoV-2 (week numbers see in the Tab. 2).

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2. A Global Weekly Mortality Cycle Related to CoViD-19.

Background: On the CoViD-19 mortality statistics presented on the '*Worldometer*' website,[12] a weekly cycle of decreased mortality on Sundays and Mondays is evident (Fig. 2). This cycle can vary in different countries,[13] but the main trend is decreased mortality towards weekends.[14]

Objective: To study the weekly mortality cycle among CoViD-19 patients.

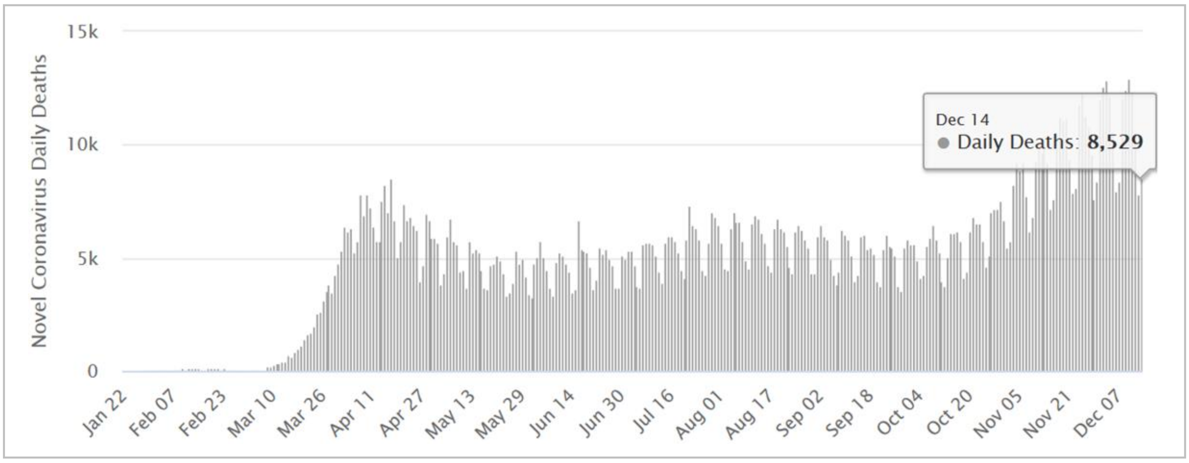

Figure 2. Daily New Deaths due to CoViD-19 worldwide (a screenshot taken on Dec. 15, 2020).

2.1. *Methods*: Since July 6, 2020, data from 'Worldometer' website were collected every 5-6 days in the form of numbers and screenshots. Data processing was divided into two parts: the first was calculating mortality on certain days of the week worldwide; the second was calculating mortality on certain days of the week in various countries.

Database of worldwide daily mortality due to CoViD-19 from January 24 to December 5, 2020, were collected on December 7, 2020 (Tab. 1).

There were comparisons between the total mortality on certain days of the week in absolute values and percentages. There was an additional criteria used, that was a ratio between a number of deaths on the day with the highest mortality and a number of deaths on the day with the lowest mortality, that can be termed as high/low mortality ratio or HLM. 40 weeks were analysed (01.03.20- 05.12.20).

Results: During the mentioned weeks there have been a total of 1,530,859 deaths from CoViD-19, worldwide. 166,688 (10.89%) patients died on Sundays, 170,185 (11.12%) on Mondays, 236,746 (15.46%) on Tuesdays, 251,387 (16.42%) on Wednesdays, 246,224 (16.08%) on Thursdays, 242,776 (15.86%) on Fridays and 216,853 (14.17%) on Saturdays.

The highest daily mortality was on Wednesday and the lowest daily mortality was on Sunday. The HLM ratio, calculated as 251,387 divided by 166,688 was 1.508 (Tab 3).

Table 3.
Absolute Values of deaths from CoViD-19 and Percentage in total and on certain days of the week.
Forty weeks were analysed (01.03.20-05.12.20). Database was collected on December 7, 2020.

week, #	Total	Sun	Mon	Tue	Wed	Thu	Fri	Sat	HLR
Total, n	1,530,859	166,688	170,185	236,746	251,387	246,224	242,776	216,853	1.508
Mean		4,167	4,255	5,919	6,285	6,156	6,069	5,421	
SD±		±1,600	±1,742	±2,474	±2,581	±2,452	±2,414	±2,024	
%	100 %	10.89%	11.12%	15.46%	16.42%	16.08%	15.86%	14.17%	

1.2. *Methods*: The comparison of the global daily mortality between various days of the week done with the calculation of the *p*-value. If *p*-value was 0.001 or less, for example, 0.0005, or 0.00005, it was presented as p<0.001. 40 weeks were analysed (01.03.20- 05.12.20).

Results: The global daily mortality on Sunday was less than global daily mortality on Tue, Wed, Thu, Fri (p<0.001) and Sat (p<0.005). The global daily mortality on Monday was less than global daily mortality on Tue, Wed, Thu, Fri (p<0.001) and Sat (p<0.01).

Discussion: If the low mortality on Sundays was related to the registration of the deceased, one could assume that all cases not recorded on Sundays must be added to the death cases on Mondays, and as a result, the number of deaths on Mondays must be not less than on other days of the week. In reality, the number of deaths on Mondays was almost as low as on Sundays.

Conclusion: For patients suffering from CoViD-19 worldwide, the most favorable or safest days of the week were Sundays and Mondays (Fig. 3).

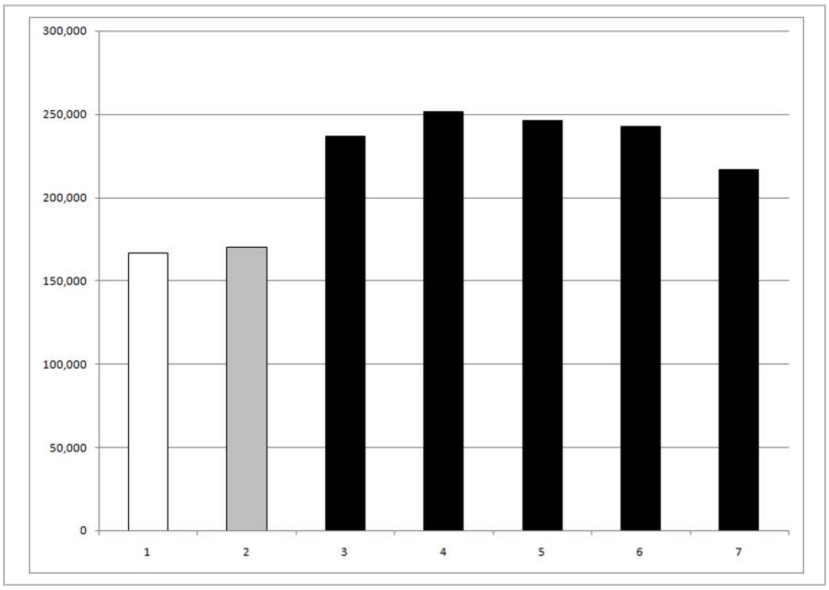

Figure 3. Global Mortality Due to CoViD-19 on Various Days of the Week (01.03.20 – 05.12.20).
A vertical axis shows absolute value of deaths; a horizontal axis shows day of the week: 1. Sunday (white), 2. Monday (grey), 3. Tuesday, 4. Wednesday, 5. Thursday, 6. Friday, 7. Saturday (all black).

3. The Weekly Mortality Cycle related to CoViD-19 in Various Countries.

Background: The global trend that may be termed the "Weekly Mortality Cycle" with more or less certainty, has been revealed in twelve countries including Argentina, Brazil, Chile, France, Germany, Mexico, the Netherlands, Poland, Russia, Ukraine, the United Kingdom and the United States.

As it has been presented above, the lowest worldwide mortality due to CoViD-19 was on Sundays and Mondays. In various countries days of the week with the lowest mortality can vary nevertheless they either belong to the weekend or they are near the weekend.

Due to the fact that the time of CoViD-19 outbreak varied in the different countries, the analysed weeks varied too. All analysed periods started on a Sunday and ended on a Saturday.

3.1. *Methods*: The data on mortality from CoViD-19 in different countries were taken from the website of 'Worldometer'.[13] A comparison of the total mortality on certain days of the week in absolute values, percentages and HLM ratio in various countries was carried out (Table 4).

Table 4:
Mortality on various days of the week. There are absolute values, percentages and HLM ratio. Database was collected on December 9, 2020.

Countries: Dates:	Total	Sun	Mon	Tue	Wed	Thu	Fri	Sat	HLM
United States 22.03-05.12.20	287,469	***22,642** 7.87%	26,410 9.19%	50,763 17.66%	52,624 18.31%	48,746 16.96%	46,973 16.34%	39,311 13.67%	2.324
Brazil 22.03-05.12.20	176,623	**13,673** 7.74%	17,008 9.63%	30,389 17.21%	31,400 17.78%	31,477 17.82%	28,211 16.00%	24,465 13.85%	2.302
Mexico 05.04-05.12.20	108,840	15,062 13.84	**7,945** 7.3	9,576 8.8	20,641 18.96	19,820 18.21	17,802 16.36	17,994 16.53	2.598
United Kingdom 22.03-05.12.20	60,746	5,235 8.62%	**4,847** 7.98%	11,121 18.31%	10,803 17.78%	9,611 15.82%	10,172 16.75%	8,957 14.74%	2.294
France 22.03-05.12.20	54,312	**4,572** 8.42%	7,690 14.16%	9,907 18.24%	7,734 14.24%	8,784 16.17%	9,572 17.63%	6,053 11.14%	2.167
Russia 29.03-05.12.20	42,620	4,614 10.83%	**4,236** 9.94%	6,672 15.66%	6,994 16.41%	6,641 15.58%	6,817 15.99%	6,646 15.59%	1.651
Argentina 29.03-05.12.20	39,578	**3,867** 9.77%	6,009 15.18%	6,201 15.67%	6,275 15.86%	5,977 15.10%	6,447 16.29%	4,802 12.13%	1.667
Poland 29.03-05.12.20	19,841	1,719 8.66%	**1,083** 5.46%	2,708 13.65%	3,709 18.69%	3,557 17.93%	3,532 17.80%	3,533 17.81%	3.425
Germany 22.03-05.12.20	18,955	**1,270** 6.70%	2,521 13.30%	3,470 18.31%	3,485 18.39%	3,276 17.28%	3,092 16.31%	1,841 9.71%	2.744
Chile 05.04-05.12.20	15,037	2,313 15.38%	1,753 11.66%	**1,105** 7.35%	1,885 12.54%	2,930 19.48%	2,507 16.67%	2,544 16.92%	2.652
Ukraine 29.03-05.12.20	13,412	1,406 10.48%	**1,172** 8.74%	1,990 14.84%	2,206 16.45%	2,185 16.29%	2,219 16.54%	2,234 16.66%	1.906
Netherlands 22.03-05.12.20	9,511	903 9.49%	**773** 8.13%	1,691 17.78%	1,642 17.27%	1,560 16.40%	1,497 15.74%	1,445 15.19%	2.188

* Absolute values on the day with the lowest mortality are highlighted by using bold font.

Results: A comparison of the total mortality on certain days of the week has revealed that in the analysed countries daily mortality on Sundays (n=5) or Mondays (n=6) was less than on other days of the week, excluding Chile, where the lowest mortality due to CoDiD-19 was on Tuesdays. The highest HLM ratio was in Poland (3.425), the lowest one was in Russia (1.651).

Conclusion: For patients suffering from CoViD-19, the safest days of the week were mostly Sundays or Mondays.

3.2. *Background*: There are several combinations of days with the lowest mortality, but the most common are Sundays and Mondays. These may be termed "Sunday Protective Phenomenon" (Fig. 4) and "Monday Protective Phenomenon" (Fig. 5) respectively.

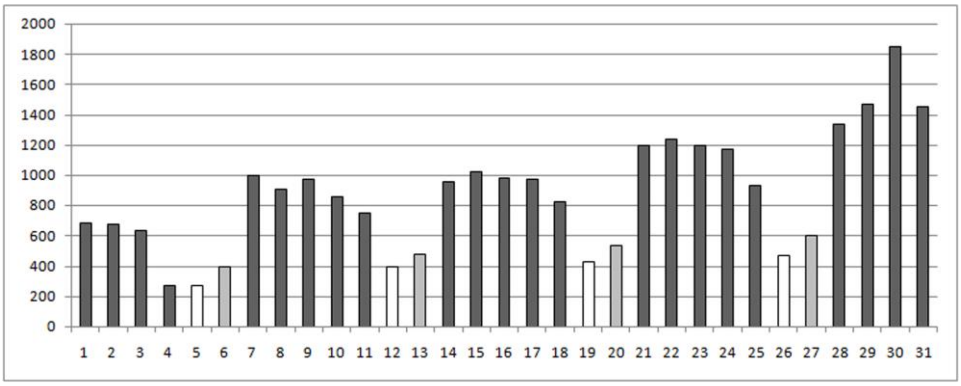

Figure 4. Daily New Deaths due to CoViD-19 in the United States, from July 1 to July 31, 2020.
A vertical axis shows absolute value of deaths; a horizontal axis shows day of the week:
Bars on the chart: Sunday is white color; Mondays is grey; Tuesdays, Wednesdays, Thursdays, Fridays
and Saturdays in turn all are black. Database was collected on December 9, 2020.

In some countries analysis of the daily mortality revealed a stable weekly cycle with the one and the same day of the lowest mortality being either Sunday (Fig. 4) or Monday (Fig. 5); but in others, the day of the lowest mortality varied being both Sunday or Monday (Fig. 6).

3.2.1. "Sunday Protective Phenomenon" was discovered in Argentina, Brazil, France, Germany and the United States.

Methods: The comparison of the daily mortality between various days of the week in various countries done with the calculation of the *p*-value.

Argentina (29.03.20-05.12.20): On Sundays, the daily mortality was less than on Mon, Tue, Wed, Thu and Fri (p<0.05).

Brazil (22.03.20-05.12.20): On Sundays, the daily mortality was less than on Tue, Wed, Thu, Fri and Sat (p<0.001). On Mondays, the daily mortality was less than on Tue, Wed, Thu, Fri (p<0.001) and Sat (p<0.005).

France (22.03.20-05.12.20): On Sundays, the daily mortality was less than on Tue and Fri (p<0.05).

Germany (22.03.20-05.12.20): On Sundays, the daily mortality was less than on Tue, Wed (p<0.01), Mon, Thu and Fri (p<0.05).

The United States of America (22.03.20-05.12.20): On Sundays, the daily mortality was less than on Tue, Wed, Thu, Fri and Sat (p<0.001). On Mondays, the daily mortality was less than on Tue, Wed, Thu, Fri (p<0.001) and Sat (p<0.005).

3.2.2. "Monday Protective Phenomenon" discovered in Mexico, the Netherlands, Poland, Russia, Ukraine, the United Kingdom.

Methods: The comparison of the daily mortality between various days of the week in various countries done with the calculation of the *p*-value.

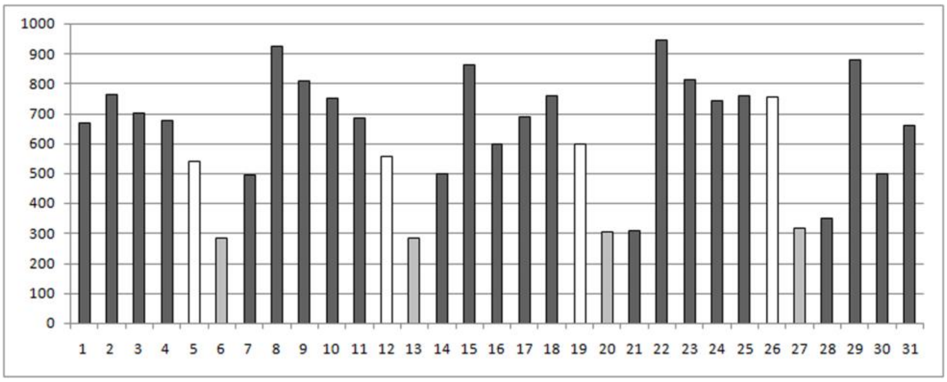

Figure 5. Daily New Death due to CoViD-19 in Mexico, from July 1 to July 31, 2020.
A vertical axis shows absolute value of deaths; a horizontal axis shows day of the week:
Bars on the chart: Sunday is white color; Mondays is grey; Tuesdays, Wednesdays, Thursdays, Fridays and Saturdays in turn all are black. Database was collected on December 9, 2020.

Mexico (05.04.20-05.12.20: On Mondays, the daily mortality was less than on Sun, Thu, Wed, Fri and Sat (p<0.001). On Tuesdays, the daily mortality was less than on Thu, Wed, Fri, Sat (p<0.001) and Sun (p<0.005).

The Netherlands (22.03.20-05.12.20): On Mondays, the daily mortality was less than on Tue, Wed, Thu, Fri and Sat (p<0.05).

Poland (29.03.20-05.12.20): On Mondays, the daily mortality was less than on Wed, Thu, Fri and Sat (p<0.05).

Russia (22.03.20-05.12.20): On Mondays, the daily mortality was less than on Wed, Fri (p<0.01), Tue, Thu and Sat (p<0.05). On Sundays, the daily mortality was less than on Tue, Wed, Fri, Sat (p<0.05) and Thu (p<0.05240).

Ukraine (29.03.20-05.12.20): On Mondays, the daily mortality was less than on Wed, Thu, Fri and Sat (p<0.05).

The United Kingdom (22.03.20-05.12.20): On Mondays, the daily mortality was less than on Tue, Wed (p<0.01), Thu, Fri and Sat (p<0.05). On Sundays, the daily mortality was less than on Tue, Wed, Thu and Fri (p<0.05).

3.2.3. In Chile (05.04.20-05.12.20) the day of the week with the lowest mortality was Tuesday. On Tuesdays, the daily mortality was less than on Thu, Fri (p<0.001), Sun, Mon and Sat (p<0.005). On Mondays, the daily mortality was less than on Thu (p<0.005).

Conclusion: The weekly mortality cycle was discovered in twelve countries, including Argentina, Brazil, Chile, France, Germany, Mexico, the Netherlands, Poland, Russia, Ukraine, the United Kingdom and the United States of America. In the majority of these countries, for patients suffering from CoViD-19, the safest days of the week were either Sundays or Mondays. In Chile, the safest days of the week were Mondays and Tuesdays (Tab. 4).

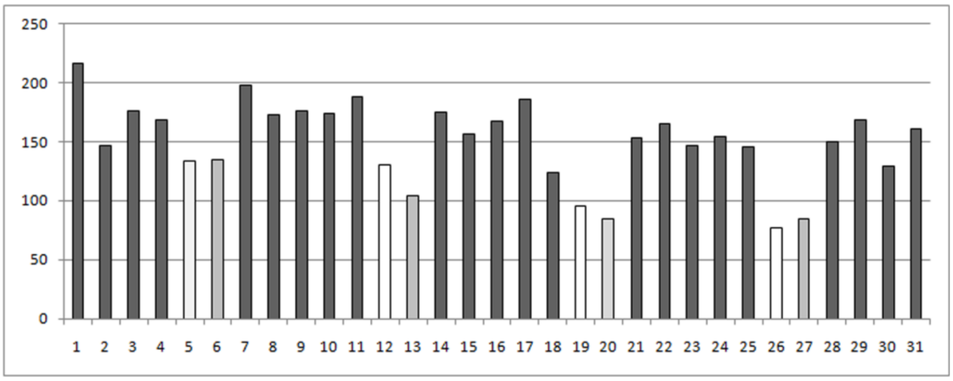

Figure 6. Daily New Deaths due to CoViD-19 in Russia, from July 1 to July 31, 2020.
A vertical axis shows absolute value of deaths; a horizontal axis shows day of the week:
Bars on the chart: Sunday is white color; Mondays is grey; Tuesdays, Wednesdays, Thursdays, Fridays and Saturdays in turn all are black. Database was collected on December 9, 2020.

4. The Weekly Mortality Cycle in the States of the United States with the highest mortality.

Background: Due to the fact that the United States had the highest numbers of deaths related to CoViD-19,[15] the weekly mortality cycle was analysed in the twenty five States with the highest mortality (~ 4000 cases and above). Database was collected on December 10-11, 2020.

Table 5.
Total Mortality and Mortality on Various Days of the Week in the certain States of the United States.
There are absolute values, percentages and HLM ratio. Database was collected on December 10-11, 2020.

Countries: Dates:	Total, n	Sun	Mon	Tue	Wed	Thu	Fri	Sat	HLM
United States 22.03-05.12.20	287,469	***22,642** 7.87%	26,410 9.19%	50,763 17.66%	52,624 18.31%	48,746 16.96%	46,973 16.34%	39,311 13.67%	2.324
1. New York** 22.03-05.12.20	34,894	**4,759** 13.64%	4,770 13.67%	5,528 15.84%	5,561 15.94%	4,691 13.44%	4,931 14.13%	4,654 13.34%	1.689
2. Texas 22.03-05.12.20	23,174	**1,461** 6.30%	1,781 7.69%	3,712 16.02%	4,327 18.67%	4,768 20.57%	4,048 17.47%	3,077 13.28%	3.264
3. California 22.03-05.12.20	19,855	**990** 4.99%	1,831 9.22%	3,667 18.47%	3,889 19.59%	3,441 17.33%	3,600 18.13%	2,437 12.27%	3.928
4. Florida 22.03-05.12.20	19,072	**1,195** 6.27%	1,487 7.80%	3,447 18.07%	3,452 18.10%	3,515 18.43%	3,308 17.34%	2,668 13.99%	2.941
5. New Jersey 22.03-05.12.20	17,412	1,424 8.18%	**1,289** 7.40%	3,164 18.17%	3,237 18.59%	3,288 18.88%	2,590 14.88%	2,420 13.90%	2.551
6. Illinois 22.03-05.12.20	13,996	1,074 7.67%	**942** 6.73%	2,343 16.74%	2,763 19.74%	2,503 17.89%	2,182 15.59%	2,189 15.64%	2.933
7. Pennsylvania 22.03-05.12.20	11,349	**647** 5.70%	766 6.75%	2,022 17.82%	2,436 21.46%	2,168 19.10%	1,844 16.25%	1,466 12.92%	3.765
8. Massachusetts 22.03-05.12.20	10,962	1,444 13.17%	**1,172** 10.69%	1,241 11.32%	2,150 19.62%	1,722 15.71%	1,684 15.36%	1,549 14.13%	1.834
9. Michigan 22.03-05.12.20	10,290	**494** 4.80%	1,107 10.76%	2,058 20.00%	1,381 13.42%	1,962 19.07%	1,380 13.41%	1,908 18.54%	4.166
10. Georgia 22.03-05.12.20	9,686	**570** 5.88%	945 9.76%	1,760 18.17%	1,703 17.58%	1,624 16.77%	1,702 17.57%	1,382 14.27%	3.088
11. Ohio 22.03-05.12.20	6,953	**365** 5.25%	593 8.53%	1,349 19.40%	1,579 22.71%	1,106 15.91%	1,199 17.24%	762 10.96%	4.326
12. Arizona 22.03-05.12.20	6,927	386 5.57%	**120** 1.73%	1,174 16.95%	1,485 21.44%	1,277 18.44%	1,159 16.73%	1,326 19.14%	12.38
13. Louisiana 22.03-05.12.20	6,527	945 14.48%	686 10.51%	1,111 17.02%	1,218 18.66%	984 15.08%	1,176 18.02%	**407** 6.23%	2.993
14. Indiana 22.03-05.12.20	6,150	**433** 7.04%	527 8.57%	1,330 21.63%	989 16.08%	954 15.51%	989 16.08%	928 15.09%	3.072
15. North Carolina 29.03-05.12.20	5,511	**334** 6.06%	335 6.08%	1,104 20.04%	1,083 19.65%	975 17.69%	937 17.00%	743 13.48%	3.305
16. Connecticut** 22.03-05.12.20	5,141	**447** 8.69%	853 16.59%	641 12.47%	978 19.02%	788 15.33%	848 16.50%	586 11.40%	2.188
17. Tennessee 29.03-05.12.20	4,898	**280** 5.72%	475 9.70%	931 19.01%	802 16.37%	938 19.15%	879 17.94%	593 12.11%	3.350
18. Maryland 22.03-05.12.20	4,831	**466** 9.64%	515 10.66%	869 17.99%	768 15.90%	734 15.19%	712 14.74%	767 15.88%	1.865
19. Missouri 22.03-05.12.20	4,628	354 7.65%	**271** 5.86%	1,083 23.40%	793 17.14%	742 16.03%	798 17.24%	587 12.68%	3.996
20. South Carolina 22.03-05.12.20	4,512	**327** 7.25%	374 8.29%	769 17.04%	831 18.42%	754 16.71%	691 15.31%	766 16.98%	2.541
21. Virginia 22.03-05.12.20	4,208	**286** 6.80%	302 7.18%	818 19.44%	797 18.94%	721 17.13%	673 15.99%	611 14.52%	2.860
22. Minnesota 29.03-05.12.20	3,974	503 12.66%	**247** 6.21%	426 10.72%	786 19.78%	744 18.72%	688 17.31%	580 14.60%	3.182
23. Mississippi 29.03-05.12.20	3,934	305 7.75%	**248** 6.30%	932 23.69%	796 20.24%	547 13.91%	571 14.51%	535 13.60%	3.758
24. Alabama 29.03-05.12.20	3,873	**142** 3.67%	251 6.48%	730 18.85%	896 23.15%	707 18.26%	671 17.30%	476 12.29%	6.310
25. Wisconsin 29.03-05.12.20	3,690	164 4.44%	**157** 4.26%	843 22.85%	672 18.21%	645 17.48%	589 15.96%	620 16.80%	5.369

* Absolute values on the day with the lowest mortality are highlighted by using bold font.
** Weekly Mortality Cycle has not been revealed in these States; in other States mentioned in this table Weekly Mortality Cycle has been revealed and confirmed.

Methods: There were comparisons between the total mortality on certain days of the week in absolute values, percentages and a calculation of HLM ratio (Table 5). Additionally a comparison of daily mortality between certain days of the week with the calculation of the *p*-value has been done.

Results: In the majority of analysed states, for patients suffering from CoViD-19, the safest days of the week were either Sundays (n=16) or Mondays (n=8).

Significant differences in mortality due to CoViD-19 between various days of the week were revealed in the states of Alabama, Arizona, California, Florida, Georgia, Illinois, Indiana, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Jersey, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Virginia and Wisconsin ($p<0.05 \div p<0.0001$).

The highest HLM ratio was in Arizona (12.375), the lowest HLM ratio was in New York (1.689).

In the State of Louisiana (22.03.20-05.12.20), twenty three Saturdays out of thirty seven had no even one fatal case due to covid-19.

Conclusion: The weekly mortality cycle was discovered in the United States as a whole country and in the certain states. The safest days of the week were either Sundays or Mondays.

5. Countries with the Unconfirmed Weekly Mortality Cycle.

In Bangladesh, Belgium, Canada, Czechia, Colombia, India, Indonesia, Iran, Italy, Peru, Romania, Spain, South Africa, Sweden and some other countries, the difference in total mortality between certain days of the week was not significant (p>0.05). Nevertheless, in the majority of countries examined, the days with the lowest mortality were either Sundays (Tab. 6) or Mondays (Tab. 7).

Table 6. Countries where Daily Mortality due to COVID-19 was the lowest on Sundays.
Mortality in various days of the week: there are absolute values, percentages and HLM ratio.
Database was collected on December 9, 2020.

Country: Dates:	Total	Sun	Mon	Tue	Wed	Thu	Fri	Sat	HLM
Italy 01.03-05.12.20	59,482	***6,856** 11.53%	7,410 12.46%	8,954 15.05%	8,775 14.75%	9,197 15.46%	9,230 15.52%	9,060 15.23%	1.346
Spain 08.03-05.12.20	46,443	**5,254** 11.31%	5,446 11.73%	7,980 17.18%	7,681 16.54%	7,149 15.39%	7,297 15.71%	5,636 12.14%	1.519
South Africa 03.05-05.12.20	21,561	**2,135** 9.90%	2,675 12.41%	3,692 17.12%	3,315 15.38%	3,620 16.79%	3,302 15.31%	2,822 13.09%	1.729
Canada 22.03-05.12.20	12,455	**1,333** 10.70%	1,502 12.06%	1,838 14.76%	1,879 15.09%	2,169 17.41%	1,872 15.03%	1,862 14.95%	1.627
Romania 22.03-05.12.20	12,186	**1,442** 11.83%	1,475 12.11%	1,991 16.34%	1,883 15.45%	1,815 14.89%	1,873 15.37%	1,707 14.01%	1.381
Czechia 29.03-05.12.20	8,802	**1,090** 12.38%	1,274 14.48%	1,368 15.54%	1,360 15.45%	1,239 14.08%	1,381 15.69%	1,090 12.38%	1.267

* Absolute values on the day with the lowest mortality are highlighted by using bold font.

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Table 7. Countries where Daily Mortality due to COVID-19 was the lowest on Mondays.
Mortality in various days of the week: there are absolute values, percentages and HLM ratio.
Database was collected on December 9, 2020.

Country: Dates:	Total	Sun	Mon	Tue	Wed	Thu	Fri	Sat	HLM
India 05.04-05.12.20	138,456	18,562 13.41%	**17,829** 12.88%	19,965 14.42%	20,814 15.03%	20,760 14.99%	20,636 14.90%	19,890 14.37%	1.167
Colombia 29.03-05.12.20	37,626	5,330 14.17%	**4,985** 13.25%	5,212 13.85%	5,414 14.39%	5,443 14.47%	5,732 15.23%	5,510 14.64%	1.150
Peru 22.03-05.12.20	36,146	5,415 14.98%	**5,032** 13.92%	5,086 14.07%	5,066 14.01%	5,041 13.95%	5,280 14.61%	5,226 14.46%	1.083
Indonesia 22.03-05.12.20	17,557	2,338 13.32%	**2,330** 13.27%	2,535 14.44%	2,674 15.23%	2,719 15.49%	2,548 14.51%	2,413 13.74%	1.167
Belgium 15.03-05.12.20	17,129	2,385 13.93%	**2,073** 12.10%	2,321 13.55%	2,840 16.58%	2,643 15.43%	2,388 13.94%	2,479 14.47%	1.370

* Absolute values on the day with the lowest mortality are highlighted by using bold font.

Table 8. Countries where Daily Mortality due to COVID-19 was the lowest on Tuesdays, Fridays or Saturdays.
Mortality in various days of the week: there are absolute values, percentages and HLM ratio.
Database was collected on December 9, 2020.

Country: Dates:	Total	Sun	Mon	Tue	Wed	Thu	Fri	Sat	HLM
Iran 01.03-05.12.20	49,973	6,965 13.94	7,261 14.53	7,265 14.54	7,335 14.68	7,323 14.65	6,969 13.94	**6,855** 13.72	1.070
Sweden 15.03-05.12.20	7,137	1,022 14.32	1,041 14.59	**986** 13.81	1,055 14.78	1,037 14.53	1,004 14.07	992 13.9	1.070
Bangladesh 05.04-05.12.20	6,805	957 14.06	982 14.43	1,055 15.5	1,008 14.82	995 14.62	**898** 13.2	910 13.37	1.174

Remarks:
The highest HLM ratio was in South Africa (1.729), the lowest one was in Iran and Sweden (1.070).

The first patients with CoViD-19 were identified in China,[16] but the local epidemic ended in March, 2020; next waves of the epidemic were not reported (Fig. 7).

6. Revision of some numbers dealing with mortality due to CoViD-19.

In several countries after revision of death records related to CoViD-19, some amount of the fatal cases were added, and this fact can be recognized as a sharp spike of deaths in the daily mortality chart.

Sudden increase of deaths number happened in China on April 17, 2020, when 1,290 new fatal cases were added (Fig. 6).[16] The local authorities provided the following explanation: "The revisions were made in accordance with related laws and regulations, as well as the principle of being responsible for history, the people and the deceased".[17]

Similar corrections happened in Canada on May 31, 2020, when 222 new fatal cases were added,[18] in Chile on June 7, 2020, when new 653 fatal cases were added,[19] and in India on June 16, 2020, when new 2006 fatal cases were added.[20] In all these cases to calculate weekly mortality cycle an average daily mortality of the affected week was applied.

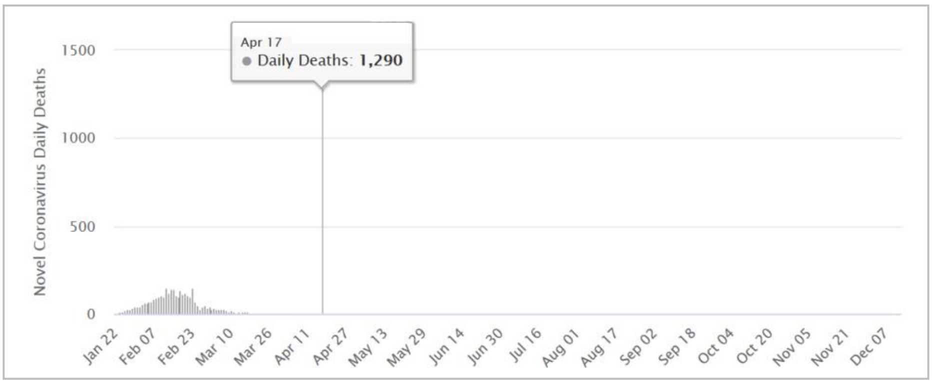

Figure 7. Sudden increase of death number in China on April 17, 2020 [a screenshot, on Dec 10, 2020].

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In some cases a sharp spike of deaths in the daily mortality chart reflected a real increase mortality in the certain day (Fig. 8), that was in Georgia on April 7, 2020: "April 7 worst virus day so far in Georgia; big increases in cases, deaths, hospitalizations".[21]

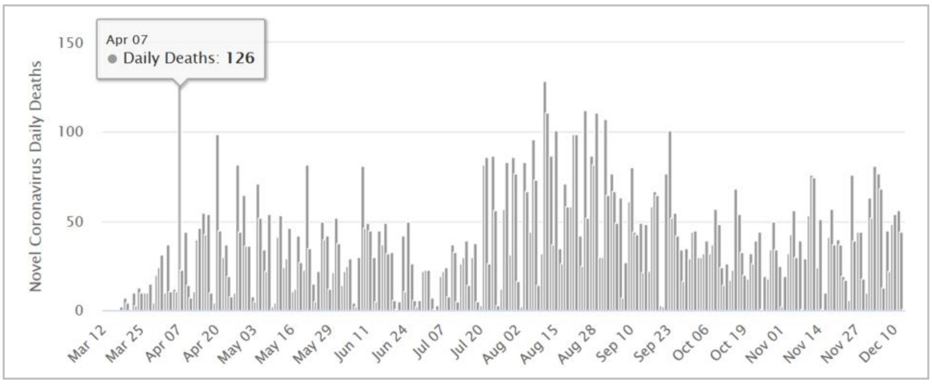

Figure 8. Sudden increase of death number in Georgia on April 7, 2020 [a screenshot, on December 10, 2020].

There was also an opposite correction that took place in France: a number of CoViD-19 victims was decreased by 217 cases on May 19, 2020 (Fig 9).[21]

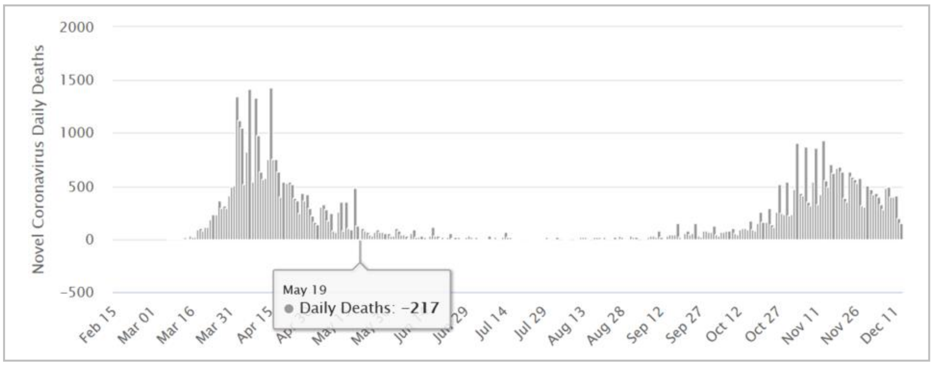

Figure 9. In France a number of CoViD-19 victims was decreased by 217 cases on May 19, 2020
[a screenshot, on December 10, 2020].

7. Updating Global Mortality Data and Weekly Mortality Cycle related to CoViD-19.

Background: During the current observation death numbers on the 'Worldometer' website related to the whole world and to the various countries were updating constantly.

Objective: To study if updating and correction of the mortality data affects the global weekly mortality cycle related to CoViD-19.

8.1. *Method*: In order to know how update of the database affects the absolute values of the total global mortality and mortality on the various days of the week, a comparison of death numbers for the first 23 weeks of pandemic (26.01.20–04.07.20) obtained at the different dates, has been done (Tab. 9).

Table 9. Global Mortality Due to CoViD-19 on Various Days of the Week (26.01.20 – 04.07.20).
There are absolute values, ±Δ and HLM ratio. Data were obtained on different dates.

Date	Total	± Δ	Sun	Mon	Tue	Wed	Thu	Fri	Sat	HLM
06.07	532,817	n/a	57,351	60,200	84,380	85,075	85,151	84,617	76,043	1.485
12.07	532,972	+ 155	57,360	60,208	84,401	85,093	85,181	84,641	76,088	1.485
02.08	536,657	+ 3,685	57,872	60,643	84,891	85,679	85,674	85,226	76,672	1.480
06.08	537,221	+ 564	57,947	60,712	84,954	85,740	85,801	85,304	76,763	1.481
17.08	539,314	+ 2,657	58,575	61,464	85,213	85,703	86,085	85,385	76,889	1.470
27.08	538,730	– 584	58,719	61,708	84,941	85,420	86,050	84,985	76,907	1.465
03.09	538,718	– 12	58,719	61,708	84,941	85,420	86,038	84,985	76,907	1.465
07.09	541,679	+ 2,961	59,242	61,935	85,405	85,723	86,357	85,641	77,376	1.458
15.09	541,679	0	59,242	61,935	85,405	85,723	86,357	85,641	77,376	1.458
20.09	541,709	+ 30	59,244	61,936	85,411	85,729	86,362	85,645	77,382	1.458
20.10	545,031	+ 3,322	59,621	62,457	85,787	86,117	86,964	86,183	77,902	1.459
20.11	546,394	+ 1,363	59,817	62,613	85,917	86,394	87,152	86,391	78,110	1.457
15.12	546,547	+ 153	59,831	62,624	85,934	86,414	87,177	86,414	78,153	1.457

Results: During the current study the total numbers of deaths related to the time frame between January 26 and July 4, 2020, were not stable. There was a fluctuation of the death numbers in the various days of the week, nevertheless the lowest numbers of deaths were on Sunday and the highest numbers of deaths were mostly on Thursday. A ratio between the death numbers on Thursday and Sunday decreased from 1.485, on July 6, to 1.457, on December 15, 2020.

8.3. *Method*: In order to know how update of the database affects the absolute values of the total global mortality and mortality on the various days of the week, an additional comparison of death numbers for other 18 weeks (29.03.20-01.08.20), obtained at the different dates, has been done (Tab. 10).

Results: During the current study the total numbers of deaths related to the time frame between March 29 and August 1, 2020, were not stable. There was a fluctuation of the death numbers in the various days of the week, nevertheless the lowest numbers of death were on Sunday and the highest numbers of death were on Wednesday. A ratio between the death numbers on Wednesday and Sunday decreased from 1.497, on August 2, to 1.464, on December 15, 2020.

Table 10. Global Mortality Due to CoViD-19 on Various Days of the Week (29.03.20 – 01.08.20). There are absolute values, ±Δ and HLM ratio. Data were obtained on different dates.

Date	Total	± Δ	Sun	Mon	Tue	Wed	Thu	Fri	Sat	HLM
02.08	655,799	n/a	71,540	73,337	103,569	107,080	104,963	103,286	92,024	1.497
06.08	656,362	+ 563	71,615	73,406	103,632	107,141	105,089	103,364	92,115	1.496
17.08	655,904	– 458	72,038	73,964	103,294	106,701	105,038	103,032	91,837	1.481
27.08	654,940	– 964	72,086	74,127	102,928	106,335	105,270	102,532	91,662	1.475
03.09	654,917	– 23	72,084	74,127	102,929	106,334	105,255	102,528	91,660	1.475
07.09	658,879	+ 3962	72,707	74,454	103,579	106,765	105,714	103,343	92,317	1.469
15.09	658,879	0	72,707	74,454	103,579	106,765	105,714	103,343	92,317	1.469
20.09	658,938	+ 59	72,709	74,458	103,593	106,775	105,723	103,353	92,327	1.469
20.10	665,569	+ 6631	73,566	75,173	104,430	107,720	106,812	104,432	93,436	1.464
20.11	666,753	+ 1184	73,749	75,300	104,526	107,998	106,964	104,617	93,599	1.464
15.12	666,940	+ 187	73,772	75,319	104,550	108,013	106,990	104,642	93,654	1.464

Conclusion: The fluctuation of the total mortality due to CoViD-19 and mortality on the various days of the week didn't affect the Weekly Mortality Cycle in general. Nevertheless additional study is required to know a reason for decrease and increase of the death numbers related to the past dates.

8. Updating Global Mortality Data and Weekly Mortality Cycle in various countries.

Background: During the current observation death numbers on the 'Worldometer' website were updating constantly. In some countries mortality data related to the past were fairly stable, in others, the correction occurred weekly or even every 2-3 days: either up or down.

Objective: To study if the correction of the database for the days related to the past affects the weekly mortality cycle in various countries.

Methods: The database related to mortality due to CoViD-19 in various countries was collected on a regular basis. A comparison of databases collected on August 10 and September 10, 2020 are presented in Tab. 11.

Results: For the majority of countries, mortality data for the past months was stable and did not change over time [Δ = 0]. Small changes have occurred in the databases of Belgium [+9], France [–24], Iran [–37], Netherlands [+125], Italy [+152] and the Unites States of America [+284]. Significant changes have been observed in the databases of Peru [+ 4064] and the United Kingdom [– 4925].

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Table 11.

Mortality in various days of the week in Brazil, Chile, Mexico, Germany, Russia, the USA and the UK, etc.

For each country, the numbers of death collected on August 10, 2020 are in the first row; the numbers of death collected on September 10, 2020 are in the second row; the difference (+/–Δ) between two numbers are in the third row.

Countries: (Dates)	Total	Sun	Mon	Tue	Wed	Thu	Fri	Sat
United States: (29.03-01.08) Δ + / –	155,115 155,399 + 284	13,825 13,827 + 2	16,024 16,028 + 4	27,178 27,180 + 2	27,525 27,525 0	25,638 26,015 + 377	24,302 24,289 – 13	20,623 20,535 – 88
Brazil: (26.04-01.08) Δ + / –	89,571 89,571 0	7,398 7,398 0	9,153 9,153 0	15,378 15,378 0	15,161 15,161 0	15,498 15,498 0	14,423 14,423 0	12,560 12,560 0
Mexico: (19.04-01.08) Δ + / –	46,142 46,142 0	5,425 5,425 0	3,704 3,704 0	4,598 4,598 0	8,441 8,441 0	8,548 8,548 0	7,847 7,847 0	7,579 7,579 0
United Kingdom: (29.03-01.08) Δ + / –	44,670 39,745 – 4925	4,041 3,737 – 304	3,646 3,524 – 122	8,333 7,187 – 1146	7,598 6,745 – 853	6,834 6,147 – 687	7,723 6,726 – 997	6,495 5,679 – 816
India (10.05-01.08) Δ + / –	33,641 33,641 0	4,348 4,348 0	4,197 4,197 0	4,739 4,739 0	5,312 5,312 0	4,911 4,911 0	5,104 5,104 0	5,030 5,030 0
Italy (08.03-23.05) Δ + / –	32,441 32,593 + 152	4,035 4,054 + 19	4,314 4,335 + 21	4,778 4,801 + 23	4,678 4,699 + 21	4,657 4,677 + 20	4,993 5,017 + 24	4,986 5,010 + 24
Spain (15.03-13.06) Δ + / –	28,088 28,088 0	3,797 3,797 0	3,911 3,911 0	4,003 4,003 0	4,378 4,378 0	4,035 4,035 0	3,986 3,986 0	3,978 3,978 0
France (22.03-16.05) Δ + / –	27,063 27,039 – 24	2,325 2,324 – 1	3,564 3,561 – 3	4,494 4,490 – 4	4,051 4,046 – 5	5,148 5,143 –5	4,121 4,118 – 3	3,360 3,357 – 3
Peru (29.03-01.08) Δ + / –	19,387 23,451 + 4064	2,593 3,307 + 714	2,626 3,298 + 672	2,770 3,357 + 587	2,825 3,224 + 399	2,847 3,464 + 617	2,795 3,346 + 551	2,931 3,455 + 524
Iran (01.03-01.08) Δ + / –	16,976 16,939 – 37	2,333 2,331 – 2	2,425 2,421 – 4	2,451 2,447 – 4	2,458 2,455 – 3	2,538 2,531 – 7	2,365 2,357 – 8	2,406 2,397 – 9
Russia: (26.04-01.08) Δ + / –	13,377 13,377 0	1,499 1,499 0	1,414 1,414 0	2,093 2,093 0	2,204 2,204 0	1,966 1,966 0	2,224 2,224 0	1,977 1,977 0
Colombia (12.04-01.08) Δ + / –	10,230 10,230 0	1,343 1,343 0	1,164 1,164 0	1,356 1,356 0	1,429 1,429 0	1,694 1,694 0	1,698 1,698 0	1,546 1,546 0
Belgium (22.03-13.06) Δ + / –	9,403 9,412 + 9	1,184 1,322 + 138	1,062 1,315 + 253	1,225 1,376 + 151	1,605 1,354 – 251	1,475 1,447 – 28	1,559 1,278 – 281	1,293 1,320 + 27
Chile (17.05-01.08) Δ + / –	8,496 8,496 0	1,354 1,354 0	719 719 0	552 552 0	1,360 1,360 0	1,490 1,490 0	1,448 1,448 0	1,573 1,573 0
Germany: (29.03-23.05) Δ + / –	7,933 7,933 0	698 698 0	1,165 1,165 0	1,337 1,337 0	1,521 1,521 0	1,321 1,321 0	1,129 1,129 0	762 762 0
Canada (12.04-20.06) Δ + / –	7,615 7,615 0	887 887 0	884 884 0	1,117 1,117 0	1,158 1,158 0	1,344 1,344 0	1,095 1,095 0	1,130 1,130 0
South Africa (17.05-01.08) Δ + / –	7,509 7,509 0	744 744 0	1,042 1,042 0	1,248 1,248 0	1,020 1,020 0	1,232 1,232 0	1,160 1,160 0	1,063 1,063 0
Netherlands (15.03-20.06) Δ + / –	5,815 5,940 + 125	641 649 + 8	488 492 + 4	994 1,013 + 19	969 985 + 16	951 969 + 18	894 924 + 30	878 908 + 30
China (26.01-14.03) Δ + / –	3143 3143 0	497 497 0	415 415 0	436 436 0	442 442 0	436 436 0	472 472 0	445 445 0

Conclusion: For patients suffering from CoViD-19, the safest days of the week were mostly Sundays or Mondays. Updating and correction of global and local mortality data didn't affect Weekly Mortality Cycle in general, but affected this cycle in certain countries.

10. A Weekly Cycle relates to Human Civilization.

In the 18th century, Antoine-Yves Goguet wrote: "We can consider as the first step that men have taken to obtain a measure of time, was the establishment of the small period of seven days, which bears the name of the week. We see that, from time immemorial, it has been used by almost all peoples, and that the arrangement has been perfectly uniform".[23]

Our contemporary, Joseph Needham, expressed a modern view on the calendar and said, that some of its elements are based on those astronomical cycles which have obvious importance for man, such as the day, the month and the year; others are artificial, such as the week and the subdivisions of the day.[24] Eviatar Zerubavel, describing the characteristics of the weekly cycle, titled his book "Hidden Rhythms".[25]

11. Discussion.

On the one hand, a week as a time frame obviously exists, but on the other, there is no natural basis that could explain a weekly cycle.

As described above the weekly mortality cycle with the trend towards decreased mortality on weekends is a unique phenomenon that has been observed among victims of CoViD-19. It has an opposite pattern compared to increased hospital mortality on weekends in the United Kingdom discussed in 2015.[26]

According to the professor Igor A. Gundarov, MD,[27] the treatment of patients with CoViD-19 is still in the phase of clinical trials and mortality in this group correlates with excessive therapeutic activity, which decreases on weekends.[28]

To understand this statement one should recall the stories on the contradictory efficiency of certain medicines and therapeutic modalities used among patients infected with SARS-CoV-2. For example:

a) *Application of Hydroxychloroquine*:

On May 22, 2020, an article was published in Lancet where authors "were unable to confirm a benefit of hydroxychloroquine or chloroquine, when used alone or with a macrolide, on in-hospital outcomes for COVID-19. Each of these drug regimens was associated with decreased in-hospital survival and an increased frequency of ventricular arrhythmias when used for treatment of COVID-19".[29] On May 25, 2020, WHO suspended hydroxychloroquine trials for COVID-19.[30] On June 13, 2020, Lancet retracted an article mentioned above due to the fact that results presented there could not be proven.[31] On July 4, 2020, WHO discontinues hydroxychloroquine (and lopinavir/ritonavir) treatment arms for COVID-19.[32] On December 1, 2020, a group of researches published their study, that included the following conclusion: "Hydroxychloroquine use was associated with a 30% lower risk of death in COVID-19 hospitalized patients".[33]

b) *Application of Corticosteroids* / *Dexamethasone*:

On March 13, 2020, WHO guidance recommended "Do not routinely give systemic corticosteroids for treatment of viral pneumonia outside clinical trials".[34] On June 16, 2020, Prof Peter Horby said, that dexamethasone "is the only drug so far that has been shown to reduce mortality – and it reduces it significantly".[35] It reduced deaths by one-third in patients receiving invasive mechanical ventilation, by one-fifth in patients receiving oxygen without invasive mechanical ventilation, but did not reduce mortality in patients not receiving respiratory support at randomization.[36] Later conclusion on efficacy of corticosteroids was pessimistic: "There is no evidence that corticosteroids are safe and effective on the treatment of severe acute respiratory infection when COVID-19 disease is suspected".[37]

c) *Application of Invasive Mechanical Ventilation*:

According to the study done several years before CoViD-19 pandemic, the highest mortality among the severest cases of patients with Acute Respiratory Distress Syndrome, who were treated with invasive mechanical ventilation, did not exceed 50.4 %.[38]

In the very beginning of CoViD-19 pandemic mortality among CoViD-19 patients who were treated with invasive mechanical ventilation was higher than 80%, including, 81%,[39] 88.1%,[40] 92%,[41] and 97%.[42] One may suppose that fatal outcome which is higher than 68% means a standard one,[43] so although invasive mechanical ventilation is still in use, it has no therapeutic effect among patients with Acute Respiratory Distress Syndrome caused by SARS-CoV-2.

12. Conclusion.

It is vitally important to recognize factors which formed the basis of decreased mortality on Sundays, Mondays and some other "safest days" of the week. These factors can relate to various aspects of healthcare, including therapeutic protocols and work schedules, or to human habits and traditions. Presumably, they relate to the optimised therapeutic protocols used on the "safest days".

If the factors, which reduced mortality on certain days of the week, could be identified, their positive effect should be spread to other days of the week. As a result many lives of CoViD-19 patients could be saved in future.

Disclosure Statement:

The author declares there are no conflicts of interest in the submitted manuscripts.

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Organotherapy, its Past, Present and Future

M.Teppone

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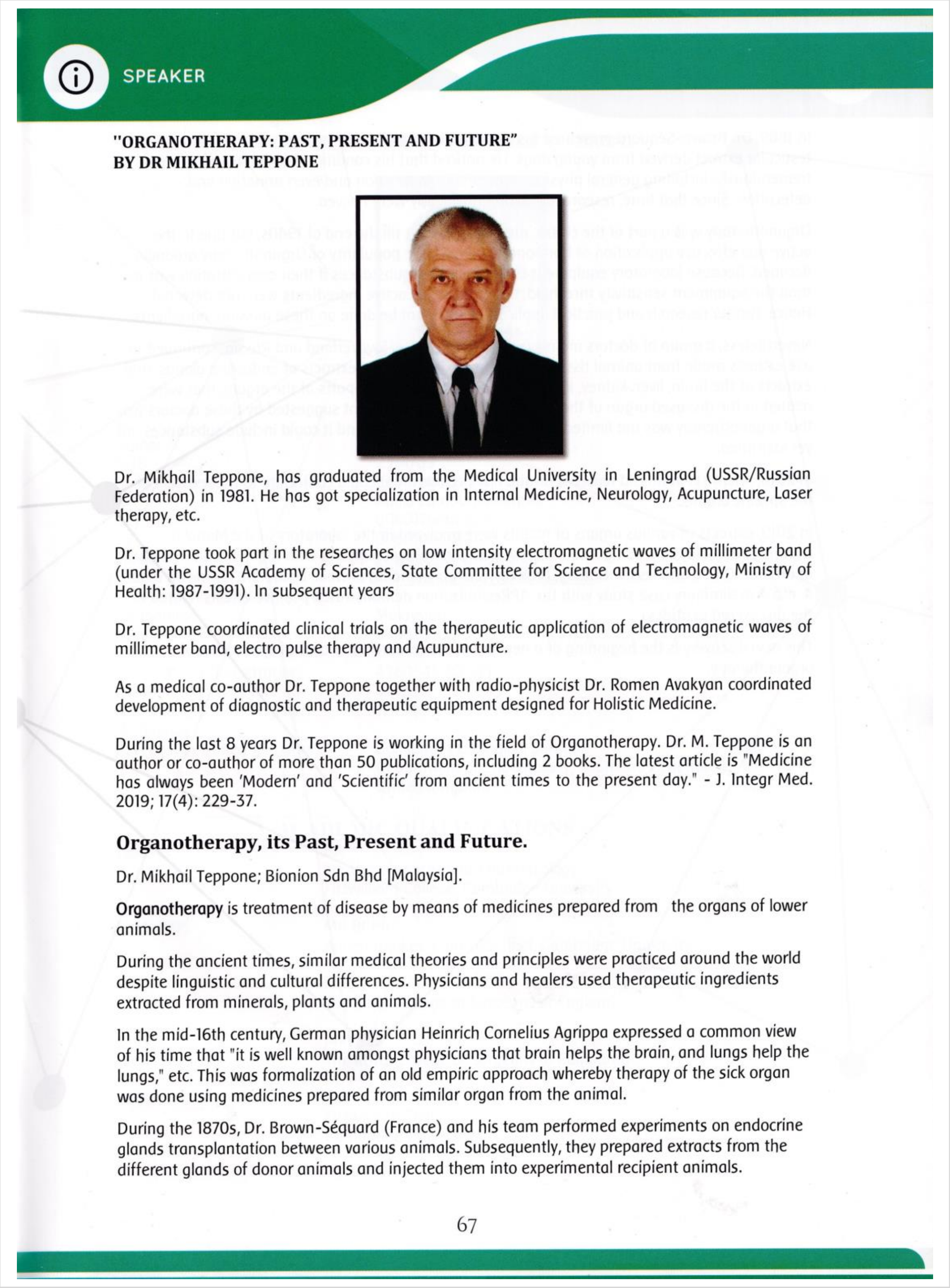


SPEAKER

"ORGANOTHERAPY: PAST, PRESENT AND FUTURE"
BY DR MIKHAIL TEPPONE

Dr. Mikhail Teppone, has graduated from the Medical University in Leningrad (USSR/Russian Federation) in 1981. He has got specialization in Internal Medicine, Neurology, Acupuncture, Laser therapy, etc.

Dr. Teppone took part in the researches on low intensity electromagnetic waves of millimeter band (under the USSR Academy of Sciences, State Committee for Science and Technology, Ministry of Health: 1987-1991). In subsequent years

Dr. Teppone coordinated clinical trials on the therapeutic application of electromagnetic waves of millimeter band, electro pulse therapy and Acupuncture.

As a medical co-author Dr. Teppone together with radio-physicist Dr. Romen Avakyan coordinated development of diagnostic and therapeutic equipment designed for Holistic Medicine.

During the last 8 years Dr. Teppone is working in the field of Organotherapy. Dr. M. Teppone is an author or co-author of more than 50 publications, including 2 books. The latest article is "Medicine has always been 'Modern' and 'Scientific' from ancient times to the present day." - J. Integr Med. 2019; 17(4): 229-37.

Organotherapy, its Past, Present and Future.

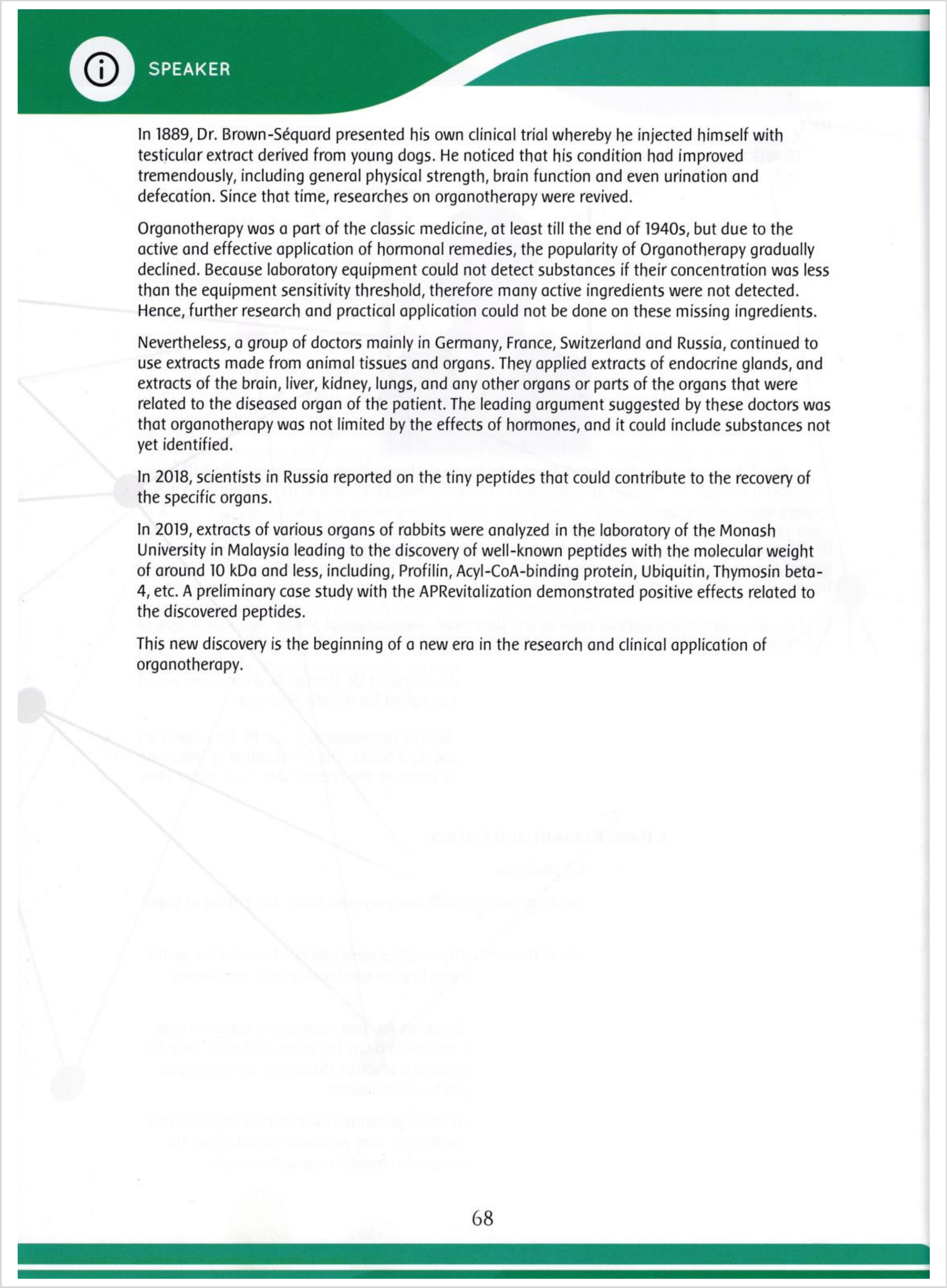
Dr. Mikhail Teppone; Bionion Sdn Bhd [Malaysia].

Organotherapy is treatment of disease by means of medicines prepared from the organs of lower animals.

During the ancient times, similar medical theories and principles were practiced around the world despite linguistic and cultural differences. Physicians and healers used therapeutic ingredients extracted from minerals, plants and animals.

In the mid-16th century, German physician Heinrich Cornelius Agrippa expressed a common view of his time that "it is well known amongst physicians that brain helps the brain, and lungs help the lungs," etc. This was formalization of an old empiric approach whereby therapy of the sick organ was done using medicines prepared from similar organ from the animal.

During the 1870s, Dr. Brown-Séquard (France) and his team performed experiments on endocrine glands transplantation between various animals. Subsequently, they prepared extracts from the different glands of donor animals and injected them into experimental recipient animals.



SPEAKER

In 1889, Dr. Brown-Séquard presented his own clinical trial whereby he injected himself with testicular extract derived from young dogs. He noticed that his condition had improved tremendously, including general physical strength, brain function and even urination and defecation. Since that time, researches on organotherapy were revived.

Organotherapy was a part of the classic medicine, at least till the end of 1940s, but due to the active and effective application of hormonal remedies, the popularity of Organotherapy gradually declined. Because laboratory equipment could not detect substances if their concentration was less than the equipment sensitivity threshold, therefore many active ingredients were not detected. Hence, further research and practical application could not be done on these missing ingredients.

Nevertheless, a group of doctors mainly in Germany, France, Switzerland and Russia, continued to use extracts made from animal tissues and organs. They applied extracts of endocrine glands, and extracts of the brain, liver, kidney, lungs, and any other organs or parts of the organs that were related to the diseased organ of the patient. The leading argument suggested by these doctors was that organotherapy was not limited by the effects of hormones, and it could include substances not yet identified.

In 2018, scientists in Russia reported on the tiny peptides that could contribute to the recovery of the specific organs.

In 2019, extracts of various organs of rabbits were analyzed in the laboratory of the Monash University in Malaysia leading to the discovery of well-known peptides with the molecular weight of around 10 kDa and less, including, Profilin, Acyl-CoA-binding protein, Ubiquitin, Thymosin beta-4, etc. A preliminary case study with the APRevitalization demonstrated positive effects related to the discovered peptides.

This new discovery is the beginning of a new era in the research and clinical application of organotherapy.

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Global Views

Medicine has always been "Modern" and "Scientific" from ancient times to the present day

Mikhail Teppone [a,b,*]

[a] Bionion Sdn Bhd, 1, Jalan Sungai Jeluh, Shah Alam, 40460, Selangor, Malaysia
[b] Bhmed INC PTE. LTD., Singapore 408705, Singapore

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ABSTRACT

Throughout human history, doctors and healers have gathered and refined the knowledge inherited from the previous generations. Different methods of effective therapy have been designed during various historical periods; when each was developed, it was considered "modern scientific medicine" for their time. Mankind has gone through natural and social disasters and survived; hence, history has proved there was no time when medical knowledge was erroneous or ineffective. Classic medicine has grown to be divided into narrow, specialized branches, causing it to lose its holistic approach and general view on health, sickness and therapeutic methods. Many of traditional medicine's effective methods have been forgotten and removed from the mainstream medicine. It would be good for modern medical education to incorporate the general knowledge of historically effective therapeutic modalities and study practical cases. Medical students should be taught how to choose a "good method" or "good medicine" independent of when that method or remedy was discovered. However, he has to keep in mind the primary goal of medicine: "*I will use treatment to help the sick according to my ability and judgment*…"(from Hippocratic Oath).

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1. Introduction

During the ancient times, similar medical theories and principles were practiced around the world despite linguistic and cultural differences. These laws and principles adhered to the concept that nature and human are united by the several basic elements, and liquids together with energy circulating within the human body and nature. This model of the nature and human body, despite its seeming simplicity, enabled various diseases to be treated using substances and methods available in the natural environment.

There is no adequate documentation of the medicinal and therapeutic practices observed by the people who occupied the Australian, American and African continents prior to the European migration to those regions.

Furthermore, there is no valid historical representation of medicinal practice in Europe before the time of Hippocrates. Only Eastern countries have retained the ancient art of healing, and hence have the advantage of developing it into a comprehensive medical knowledge-based system.

2. Traditional Chinese medicine is a unique heritage of antiquity

According to traditional Chinese medicine (TCM), energy and blood circulate through the human body using special pathways known as "channels" and "collaterals." This process supports the functions of the internal organs and protects them. When disease ensues, the cause may be internal (e.g., hereditary or strong emotions) or external (e.g., physical, chemical or biological factors) and is described by the terms "wind," "heat," "cold," "dampness" and "dryness." Some etiological factors cannot be described accurately as external or internal, and others are both nature combined.

Pathological conditions can belong to the "deficiency" or "excess" and "cold" or "hot" types. The therapeutic approaches seek to reinforce or to cleanse the body and to restore balance. Relatively simple ailments known as "outside diseases" can be treated with massage, chiropractic therapy, breathing, physical exercises, acupuncture and moxibustion. Deeper issues or "inside diseases" require additional special diet and various medications [1,2].

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* Address: Bionion Sdn Bhd, 1, Jalan Sungai Jeluh, Shah Alam, 40460, Selangor, Malaysia.
E-mail address: mikhail.teppone@gmail.com

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Based on their specific therapeutic effects, all herbs/medicines are described as diaphoretic, diuretic, cleansing, tonics, calming the mind, etc. Within these groups, the herbs are subdivided into hot, neutral, and cold according to their properties. In addition, herbs have various tastes (sour, bitter, sweet, spicy, salty and bland) and attitudes towards certain channels and organs. The pharmacopeia of TCM includes products of mineral, plant, animal and human origins [3].

The concept of Dao (道), unites all parts of the universe—everything known and unknown, and all connections and interactions between the parts. All parts and aspects of the universe are divided into two major groups known as Yin and Yang. Further, comparison and analysis of the relationships among the various aspects of the human body and nature are described in detail by the law of the 5 elements (wood, fire, earth, metal and water).

All these terms used in TCM first appeared in ancient oriental philosophy, and have very broad meanings in contrast to the modern scientific terms, characterized by precision and specificity. However, modern medical science has designed various mathematical models to describe the general laws of physiological and pathological processes within the human body and these models resemble the approach applied in TCM. TCM terms and principles look like algebraic equations. Therefore, these general terms enable the doctor to understand the specific condition of his patient and prescribe the correct therapeutic protocol. This is applicable not only to common diseases but also in cases of unknown etiology and pathogenesis, where modern diagnosis and treatment are undefined [4]. Ancient Indian and Tibetan medicines are similar to the TCM described above [5,6].

3. Modern scientific medicine in ancient Greece

The ancient Greeks' medical knowledge can be found in the Hippocratic Corpus—a collection of medical treatises written by various authors during and prior to Hippocrates's time (460–370 BC) [7]. The ancient Greeks recognized basic elements similar to those known in China and India. They described four liquids (humors) circulating within the body, including yellow bile, black bile, blood and phlegm, which have similarities to the four elements and their qualities. Four pairs of large veins described in the ancient Greek anatomy [8] were actually more similar to the "channels and collaterals" known in TCM than the blood vessels in the modern medical sense.

The ancient Greeks believed that diseases could be caused by the stagnation and accumulation of the four humors and that the body could be damaged by weather extremes, including excessive heat, cold, humidity, dryness and high winds. Further, they believed that some diseases were induced by diets rich in a certain quality (e.g., sour, bitter or salty) [9]. In order to prevent diseases and provide therapy, Hippocrates's recommendation was to follow nature—choosing a healthy place for living, wearing clothes appropriate for the weather, and consuming food and medicines which could maintain and restore the body's balance. Thus, the ancient Greeks believed that food or medicines with "dry" qualities were helpful to balance cases of dampness; "hot" food and medicines could balance "cold" conditions, and "cold" food and medicines would treat "hot" conditions.

4. Modern scientific medicine at the time of Avicenna

Abu Ali Ibn Sina (Avicenna, 980–1037) was a famous doctor in the Middle East [10]. At the very beginning of the first book of *Canon of Medicine*, Avicenna described the four elements as fire, air, water and earth. Moreover, he expounded on the four liquids (humors), including yellow bile, black bile, blood and phlegm, which circulated within the human body. Avicenna also went on to explain the various conditions of the human body—warm, cold, dry and humid and that the energy of the body could be in excess, deficiency or balance.

Besides his detailed description of the arteries and veins, Avicenna identified "energies" or "living forces" and their relationships to the organs. Among the etiological factors for disease, Avicenna noted various types of weather that were related to the seasons. Moreover, he advised that special attention should be paid to the wind that blew from certain directions. He concluded that some diseases were caused by living conditions, emotions, sleep quality, nature or the taste of food and beverages. Avicenna had deep understanding of different diagnostic methods which resemble the methods used in TCM, including analysis of pulse, urine and stool [10].

The *Canon of Medicine*, written by Avicenna, is a collection of medical knowledge from the Far East, Middle East and Europe, particularly from Greece, which was the reason why Avicenna's books were used in Europe as a medical canon by doctors for generations [11].

5. Great turn in the medical paradigm at the time of Dr. Paracelsus

For centuries, there was only gradual change in medical knowledge. In every generation, doctors improved on the knowledge that they had inherited from the previous generations. For research and everyday practice, doctors still referred to classic books written decades and centuries previously because human's medical needs had changed very little over the intervening centuries. Crucial changes in medicine began with the development of the various fields of science. These changes are linked to famous historical discoveries and names.

Philippus Aureolus Theophrastus Bombastus von Hohenheim (1493–1541), one of the famous doctors in Medieval Europe, was born in Switzerland. Like all learned people of that time, he was an astrologist, alchemist, philosopher, magician and a medical doctor. Philippus was known as a "reformer" in medicine, and at times, was compared to Martin Luther, who was a reformer in religion. Therefore, he was called "Luther in medicine" [12]. But Philippus's attitude towards medicine was different from other doctors. He recommended rejecting all knowledge of the past so that he could build a new perspective for medicine based on his own experience. Hence, he was more of a hero of revolution rather than reformation [13].

In a medical school, Philippus studied books written by ancient authors. However, prior to his first lecture at the University, he publicly burned commonly used medical textbooks, including the works of Avicenna, Galen, and others, saying, "*Sic vos ardebitis in gehenna*," which means "It will burn in hell" [12]. One could assume that either Philippus did not understand the medical principles described by his great predecessors or he considered that his own knowledge and experience were sufficient for the future development of medicine, and hence he did not see the need of medical sciences from previous centuries. He even took a nickname "*Paracelsus*" that literally means "beside" Celsus or "greater than Celsus" [13].

"*Paracelsus*" rejected the liquid theory related to the human body. He reckoned that diseases were caused by chemical changes within the body so the therapy should be based on chemical substances that could fix abnormal chemical conditions. For Paracelsus, he considered mercury and antimony as primary medicines. However, he also used medicines derived from plants, and opium was one of the most popular ingredients in his pharmacopeia [12].

The new trend in medicine, then, was to differentiate diseases based on chemical changes, and to find or design a pure therapeutic substance which could reverse the chemical changes related to each specific disease. The implementation of this approach was impeded by the lack of essential diagnostic technology during the time of Paracelsus. Biochemical tests of animals and human tissues became available only at the beginning of the 19th century [14]. The first publications dealing with hematological tests appeared at the end of the 19th century [15]. The first demonstration of X-ray imaging took place only in 1895 [16]. The first case of ultrasound diagnostic was published in the middle of the 20th century [17].

Nevertheless, the great revolution in the medical paradigm started at the time of Dr. Paracelsus and continued on for centuries. Gradually, classical medicine lost its holistic and systemic approach and was replaced by increasing specificity: specific names for diseases, types of pathogenesis, specializations in the narrow fields of the healthcare and specific medicines to restore certain chemical changes. Concurrently, the concept of a "prominent doctor" was replaced by the "efficacy of the chemical substances."

6. Chemically based medicine with the precise choice of the chemical substance

Another trend that emerged from the evolution of medicine can be traced to Samuel Hahnemann (1755–1843), the founder of homeopathy. Through his theory and experiments, Samuel Hahnemann concluded that a "poison" that caused certain symptoms in the body, known as its "pathogenesis," could be used to treat these particular symptoms when given to the patient in a tiny dose. Homeopathic "therapeutic poisons" are from the natural environment, for instance, toxic substances from minerals, plants and animals.

The homeopathic pharmacopeia was a collection of remedies from the historical records of poisoning supplemented with results from animal experiments and human clinical trials. The efficacy of homeopathic treatment was believed to depend on the similarity between the symptoms of the disease and the pathogenesis of the substance used [18–20].

The Principle of Similarity is presented in the homeopathy by the specific pathogenesis of the remedy, by the individual features of the patient and by the specific clinical manifestation of a disease. For example, if the main symptom is pain, various characteristics of the pain would be analyzed, such as location of the pain, the predominant side of the body affected by the pain, the usual time the pain occurs and subsides, factors that strengthen and weaken the pain and even secondary symptoms associated with the pain. Homeopathic treatment is effective only in cases of individualized prescription, which must be adjusted constantly as the patient's symptoms change [18–20].

It takes a knowledgeable and an experienced physician to be an expert in homeopathy since he has to remember a vast number of "pathogeneses" with their specific symptoms and additional modalities. Furthermore, he must be able to differentiate between the various "pathogeneses" with similar symptoms in his search for the one that best matches the patient's clinical manifestation of the disease.

If a researcher conducting homeopathic clinical trials does not have sufficient knowledge and experience in this particular field, he will not be able to obtain good results from the study, and thus will conclude that the homeopathic therapy did not work. An unqualified researcher may even present the results from the clinical trials as a modern statistically proven paper to affirm that homeopathy is, indeed, ineffective.

Homeopathy, psychotherapy, chiropractic, acupuncture, massage and even surgery fall under the realm of healthcare where the effectiveness of the therapy relies mainly on the qualification and experience of the practitioner rather than on the tool (e.g., lancet, acupuncture needle, massage oil and medicines) of the healer.

7. Organ-specific remedies throughout the centuries

The concept of using "organ-specific remedies" to treat diseased organs was quite common among ancient doctors. Berridge [21] wrote that principle *similia similibus curantur* or "like cures like" as a rational empiric mode of treatment was already known in Europe at least in the 12th century. In the 16th century, German Magician Heinrich Cornelius Agrippa (1486–1535) expressed a common view of his time: "As it is WELL KNOWN amongst physicians that brain helps the brain, and lungs the lungs" [22].

A detailed description of how to use parts of different animals to cure various diseases could be found in the *Natural History of Pliny the Elder* (AD 23–79), written in the first century AD [23]. This unique document also confirmed that goat and sheep placenta had already been used by physicians in treating female disorders [24].

In 1498, the officials from the guild of doctors and apothecaries in Florence published the European pharmacopoeia *Ricettario Fiorentino*. It included a list of prescriptions that apothecaries were bound by law to follow. Simple ingredients and complex prescriptions were drawn from the books of Dioscorides, Serapio, Galen, Rhazes, Avicenna and other famous physicians prior to and during that era [25]. Its 1789 edition comprised various animal-derived remedies, for example, deer antlers, lobster gills, cuttlefish bones, fat of duck, or rabbit, or bear, and also various types of insects, including Spanish flies, cochineal and ants [26].

The first edition of the *Pharmacopoeia*, complied by Johann Schroeder, was published in 1641. Tinctures or extracts were made from the spleen of bull; from the heart of wolf; from the liver of wolf, frog or pig; from the lungs of sheep, pig, bear or fox; and from the bone marrow of cow, horse, dog or sheep. Deer placenta and human placenta and umbilical cord also were included in the list of the simple ingredients of therapeutic remedies [27].

Discoveries by Giovanni Battista Morgagni (1682–1771), who established the anatomic concept of diseases originating from organs [28,29], reinforced support for the "organ-specific remedies." Since that time, doctors could ignore the essential relationship between a symptom and its related organ, but could diagnose the location of the problem quite precisely. As a result of that discovery, doctors could use specific parts from the animals to treat the corresponding organs and tissues in human.

8. Application of animal tissues and organs for replacement therapy

The first attempt to use animal origin products for injection, transfusion or even in a surgical transplantation was reported in the 17th century. In 1667, the earliest cases of blood transfusion from sheep to human were reported in France [30] and in England [31]. In 1668, a Dutch surgeon J. van Meek'ren cited a case from Russia where dog bone was grafted into a patient's skull [32]. Yet surgical transplantation of animal tissue into the human became a common medical practice only two centuries later.

A new dictionary of practical medicine and surgery, published in 1872, had already described successful transplantation of skin taken from guinea pig, dog or rabbit [33]. Further, a piece of mucous membrane from a dog was successfully grafted into the mouth of a boy in the case of spurious ankylosis of jaws [34]. Two cases involving dog bone transplantation to close the defect of a patient's skull were reported from England [35] and France [36].

In addition, Dr. Helferich, of Munich, transplanted a muscle from dog to a female patient to refill the gap left by removal of a large fibrosarcoma (1882) [37]. Dr. Gersung of Vienna, an assistant to Prof. Billroth, performed successful transplantation of a sciatic nerve from a rabbit to a patient who was a professor of the university, Dr. Ernst von Fleischl (1885) [38]. Thyroid gland transplantation from sheep to a patient with myxedema was performed in 1890 [39].

In 1890, Dr. Themistocles Gluck was of the opinion that cellular therapy was slowly yet steadily developing, based on the theory of cellular pathology; positive results in various types of transplantation expressed the cellular therapeutic direction in its purest form [40]. However, all the examples mentioned above are related to replacement therapy, where the defects of a certain organ or tissue were substituted with similar tissue from animals, which was only a part of the concept of cellular therapy in the general sense.

9. Cellular therapy designed by Dr. Charles-Édouard Brown-Séquard

Organ-specific products from animals were being used in the classic medicine even during the mid-19th century. In 1857, a special chapter "*Animals Yielding Products Employed in Medicine*" was included in the *Supplement to the Pharmacopeia*, published in London. It detailed the general descriptions of various animals, as well as indications and prescriptions of animal-based remedies compiled from medical books of the past centuries [41].

A new step in the development of modern medicine followed the work of Rudolf Virchow who declared in 1855 that disease was pathology of cells [42,43]. That theory was foundational to our contemporary understanding of pathogenesis of diseases, and it also encouraged development of a new field in the medicine, known later as the stimulating or rejuvenating type of cellular therapy.

At the end of 1860s, during a series of lectures at the Faculty of Medicine in Paris, Dr. Charles-Édouard Brown-Séquard explained that some organs, particularly the glands, had specific influence on the nervous centers. He also proposed a new idea of intercellular interaction: "*if into a man, old or feeble, the living cells of a young and vigorous being could be injected, why should he not vibrate in unison with this fresh life, which pervades him so intimately* [44]*?*"

During the 1870s, Dr. Brown-Séquard and Dr. D'Arsonval carried out the experiments of grafting endocrine glands between animals. Later they prepared extracts from the different glands of donor animals and injected them into experimental recipient animals [45].

From the very beginning, research and development of cellular therapy—as a stimulating or rejuvenating method—were divided in two different directions that sometimes overlapped. However, in several decades, both of them were partly replaced by therapy that relied on hormonal remedies. Doctors from one group used extracts from organs of animal, but another group of doctors preferred to use whole living organs, or pieces of the tissue taken from animals.

9.1. Rejuvenation cellular therapy with the extracts prepared from animal origin tissue

In 1889, Dr. Brown-Séquard presented his own clinical trial whereby he injected himself with testicular extract derived from young dogs and noticed that his condition had improved tremendously, including general physical strength, brain function and even urination and defecation [45,46]. We can assume that Dr. Brown-Séquard had low testosterone level, and it was increased after injection of extracts from dog's testicles. But according to the modern study contents of testosterone in the injected liquid were not enough for therapeutic effect [47], so it was not replacement therapy in the modern sense. Actually, it was a new version of the stimulation and rejuvenation cellular therapy, based on the old principle which was to use organ of the animal to treat the same organ in the human.

Soon after, Dr. Variot reportedly injected his patients with fresh testicular extracts derived from rabbits or guinea pigs, with similar optimistic results [48].

Obvious rejuvenation in the experiments on animals, and similar effects among patients who were injected with extract derived from testicles of guinea pigs, but were not informed about the contents of the liquids or their expected effects, helped to dispel the notion that positive results were due to the power of suggestion.

In 1891–1892, Drs. George Murray and Wallace Beatty presented several cases where myxedema had been cured successfully with liquid obtained from sheep's thyroid glands [49–51]. In 1894, Dr. Derrien also published a short review of myxedema being treated using extracts derived from the thyroid gland, and he argued that, although the mode of action was only hypothetical, the action itself was unquestionable [52]. Similar technology was used to treat various syndromes related to diseases of ovary and uterus or to premature menopause [53]. This therapy of applying extracts from animal organs became known as the "Brown-Séquard method" [54–55]. The treatment by the injection of goat lymph mixed with extracts derived from goat brain and testicles known as the *Roberts Lymph Treatment*, was one of the versions of animal-derived "cellular therapy" [56].

The book *System of Practical Surgery*, published in 1904, has a section focused on treating tetany and cachexia after excision of the thyroid gland. The author commented, "Organotherapy has been very successful, whereas other methods of treatment have been devoid of results. Transplantation of the thyroid gland, or injection with thyroid (*extract*), or internal administration of thyroid gland tissue has been followed by brilliant cures" [57].

In the early 20th century, organotherapy was already known as a scientifically based and effective therapeutic method. Efficacy of organotherapy depended largely on the work or multiple professionals, including the pathologists who traced relation of the symptoms to the sickness of certain organs, the physicians who discovered similar symptoms in the patient and the chemists who handled with the animal organs, extracting their chemical components, and transforming them into forms which could be administered to a patient [58].

9.2. Therapeutic and rejuvenation cellular therapy by the transplantation of whole glands

After the successful case of testicle extract injections reported by Dr. Brown-Séquard [45], surgeons in Europe started transplanting sheep thyroid glands into patients suffering from myxedema [39,59,60]. Almost 25 years later, Dr. Voronoff presented a case where a boy with myxedema received both thyroid and parathyroid transplants. The uniqueness of this case was that the thyroid gland was taken from an ape [61] and that four years later that patient "had been declared … fit for military service and had marched to defend his country like any other man" [62].

The next transplanted organ was a testicle. There were some discussions on the priority of a case where an animal testicle was grafted into a human, but now it is clear that Greek surgeon Skevos Zervos was the first to perform the transplantation of ape testicle to a man in 1910 [63]. Twelve years later, Max Thorek analyzed the results of similar transplantations and proved histologically that testicles taken from apes and transplanted to men were vascularised and in full activity [64].

9.3. Fusion or combination of both types of cellular therapy

At the close of the 19th century, doctors had already developed therapy in the case of hormone insufficiency. The technique used was either grafting the corresponding organ [39] or injecting fresh or preserved extracts prepared from the counterpart organ of the donor animal [45].

In 1892, Italian Prof. Capparelli [65] presented results of experimental transplantation of small pieces of pancreatic tissue, not by conventional surgery, but simple injection by syringe. Twenty years later, Dr. Hermann Küttner shared his experience on curing thyroid gland insufficiency. He stated that, up to that point, endocrine gland transplantation had not produced a permanent result—the implanted organ usually degenerated and eventually might undergo necrosis and absorption. Thus, Dr. Küttner [66] suggested that thyroid gland implantation should be followed by injection of thyroid tissue emulsion. More than a decade later, in 1927, Drs. Kurtzahn and Hübener [67] reported immediate physical and mental improvement using Dr. Hermann Küttner's method in two out of three patients with myxedematous cretinism. Drs. Kurtzahn and Hübener treated their patients by injecting 4–5 mL of fresh thyroid tissue pulp intramuscularly. Although the results were not long-lasting, the procedure had the advantage of being easily repeated. In 1929, Dr. Küttner once again attracted the attention of other physicians when he performed an endocrine gland tissue transplantation by injection. This method had its benefit, as the procedure was only a minor surgery, done under local anesthesia, and could be repeated as soon as the effect of the treatment diminished [68,69].

Meanwhile in 1931, Dr. Paul Niehans, from Switzerland, injected a suspension containing small pieces of parathyroid gland tissue, taken from a newborn ox, into a female patient with tetany, caused by an accidental surgical removal of her parathyroid gland. The effect was a total miracle—all her symptoms disappeared. She went on to live for more than 30 years and died at the ripe old age of 94 [70,71].

Subsequently, injections of diluted dried cells and small pieces of live animal tissue gained popularity as treatment for delayed development in childhood [72–74], and in anti-aging and rejuvenation programs [75,76]. Improvement in the objective and subjective parameters in a clinical trial comprising a large group of children with Down syndrome [77] rejected the hypothesis of "placebo effect" as the mechanism of the therapy.

9.4. Organ-specific cell therapy was supplanted by hormonal replacement therapy

By the beginning of the 20th century, physicians and physiologists had already gained understanding of the internal secretions made by ductless glands. The first chemical messenger that regulates digestion (secretin) was discovered by William Bayliss and Ernest Starling in 1902 [78]. In 1905, the new term "hormone" was presented to the medical world [79–81]. Over time, in addition to the transplantation of entire endocrine glands, suspensions of live cells and extracts of organs, physicians devised a new method of replacement therapy, using pure hormones extracted from animal organs or synthesized biochemically.

Due to the active and effective application of hormonal remedies, the popularity of cell therapy gradually declined. Only a small group of experts in cellular therapy, mainly in Germany, France, Switzerland and Russia, continued to use live cells or cell extracts as a part of their daily practice. The leading argument suggested by those doctors was that cell therapy was not limited by the effects of hormones, and it could include substances not yet identified. But science was advancing and now, recent studies have identified peptides that are specific for various organs and can contribute to recovery of the specific organ [82–84].

Besides, some of the degenerative diseases of internal organs, brain, peripheral nerves, muscles and other tissues are not caused by hormonal deficiency, thus hormonal therapy would not be effective. Therefore, this small group of "incurable" diseases and syndromes could be a niche for further research and practical application of cellular therapy.

10. Further development of chemically based scientific medicine

At the close of the 18th century, Dr. John Brown (and G. Cullen) believed that all pathological and healthy conditions could be classified as *sthenic* (active) and *asthenic* (nonactive) diseases respectively, with the normal condition in-between. *Sthenic* disease could transform into *asthenic*, and vice versa. They used stimulating or sedating therapy, including tonic remedies and warming methods or cleansing and bloodletting, according to the activity of pathological process and patient's body status [85]. During the 1930s, Dr. Hans Selye reconfirmed the dynamic changes in pathological conditions from the alarming phase (*sthenic*) to exhaustion (*asthenic*) and described that transformation by applying the general adaptation syndrome theory [86,87].

As mentioned before, ever since the time of Paracelsus, there was a widespread desire to study chemical changes, especially for certain diseases. Achievements in medicine went hand-in-hand with the development of diagnostic equipment. Various active "chemical substances," which play an important role in the animal and human body, were discovered, including proteins, lipids, carbohydrates, minerals (before the 20th century), hormones (1902) [78–81], the kinin-kallikrein system (1909) [88], vitamins (1910–1912) [89], prostaglandins (1935) [90], free radicals and antioxidants (1954) [91,92] and endorphins (1975) [93].

Stimulating methods and replacement medicines are usually recommended for cases where low-functioning activity or "insufficiency" (*asthenic condition*) occurs. Application of active substances, such as hormones, vitamins, blood, or bone marrow, serves as a common replacement therapy. On the other hand, when the functional activities of certain organs, tissues, cells (tumor or bacteria cells) or ion pumps are unreasonably high (*sthenic condition*), the modern treatment is to apply blockers, inhibitors, antagonists or even surgery. This involves medicines such as β-blockers, H_2-blockers, prostaglandin antagonists, antihistamine medicines, calcium pump inhibitors, cytostatics or antibiotics. As an example, following the discussion of "*sthenic*" and "*asthenic*" types of diseases, phosphodiesterase type 5 (PDF-5) inhibitors would be a logical choice only when there is a high activity of PDF-5, for instance in the case of diabetes mellitus patients [94], but not in the case of erectile dysfunction with normal or low activity of PDF-5. All treatments using inhibitors, blockers or antagonists should follow this approach.

11. Main obstacles to the development of today's modern scientific medicine

An assumption can be made that the factors limiting the development of modern medicine are rooted in how a medical doctor is educated. The process of training a medical doctor is very different than the training given in other natural sciences or the arts. For example, a child learns to count in the first years of his life. He starts by counting with his fingers, gradually moves on to more complex calculations, and he puts this knowledge to daily use. At the university, he studied about the most advanced type of calculation during that time. This process of education actually replicates the historical development of mathematical science. The same is true about physics, fine arts or music.

Education in the field of healthcare is quite different. Medical science begins with the usual familiarity of vaccinations and pills for headache or common cold. At school, the basic knowledge in biology is imparted to the students. Then, at the university, a medical student is proficient solely in the latest achievements of medical science and practical experience, but he has very little knowledge about therapeutic methods and medicines from thousands or even hundreds of years ago.

Up till the Middle Ages, the gradual progress of medical science was tied to the achievements of its many prominent practitioners. Subsequently, the new knowledge resulted in the revolutionary development of the basic sciences, including physics, biology and chemistry, causing radical advancement in the fields of physiology, pathology and pharmacology.

Since the time of Dr. Paracelsus, classic medicine has seen continuous sweeping changes. Describing this progression, Dr. William C. Krauss commented in 1893, "The epoch in which we live may well be called the sky-rocket period of the 19th century. Men, like methods, approach their zenith with an increasing roar and sparkling brilliancy, and as suddenly fade, to fall with dull and heavy thud. What was yesterday a seemingly brilliant success becomes today a glittering failure, and the shores of time are laden with the wrecks of 'wonderful discoveries'" [95].

Due to the strictly regulated medical practices, many aspects of the ancient medical science are forgotten or their use is forbidden. Thus, a "well trained doctor" mainly means that the physician is knowledgeable in the findings of modern research but is uninformed of the vast medical experiences from the past generations.

During their graduate education, some doctors would like to fill in gaps in knowledge between contemporary and ancient or medieval medicine, but differences in the terms used in the ancient and modern medical languages make it difficult. Moreover, the medical community has forgotten that throughout human history doctors have practiced the most "modern scientific medicine" of the time. Now these older versions of modern medicine are called "folk" or "alternative" medicine, and the lack of knowledge about the achievements of previous generations has led to a skeptical attitude toward the medical experience of the ancient physicians.

Another obstacle lies in the manner of how diseases are classified. Although classification basically uses the general parameter to describe the localization of the pathological process, the succeeding steps are not systematic and are unnatural. Some diseases are titled and categorized based on their macro- or microstructural changes, including cytological or histological findings, but others are described by the various functional abnormalities detected by instrumental examination (e.g., blood pressure measurement, electrocardiography and electroencephalography) or by laboratory tests (e.g., blood or urine analyses), etc. Further, there are some diagnoses that have no scientific definition and do not fit into the concept of modern diagnosis at all. These include "chronic fatigue syndrome," "irritable bowel syndrome," "restless legs syndrome," "ingrown nails," "hyperactive child," "acrophobia" and "claustrophobia," among others.

Classification sets back the organizing of homogeneous trials and control groups because patients with a similar nosological form may be grouped together but may not have the same clinical manifestations or the same internal abnormalities, as verified by modern diagnostic analysis. Usually, patients in a group share only the main parameters described by the identification of the nosological form. For example, in a group of duodenum peptic ulcer patients, there were at least 4 different subgroups, as identified by the complaints and clinical manifestations which required different therapeutic protocols and had different treatment durations [96].

The modern trend is to define the chemical changes in each nosological form or pathogenic mechanism and to develop pure medicines with specific effects for the particular pathogenic mechanism or disease. Hence, any secondary or additional effects of the medicines are regarded as side effects. If a patient suffers from several nosologic forms bearing different chemical changes, he would require more than one type of medicine to address each malady separately. This causes polypragmasia, unnecessary prescription of multiple drugs, to be fairly common in contemporary medical practice.

In the modern pharmaceutical world, studies described as "double-blind trials" are far from perfect. This kind of study can be applied only to a specific group of medicines with relatively short therapeutic effects depending on the dose. But there are no clinical trials for the standard "inert" substances used as the "placebo." There are no trials to compare the efficacy of the different "inert" substances in treating various diseases. There is a common belief that either the "inert" substance itself possesses no pharmaceutical activity within the patient's body or its effect is negligible. But in TCM, "inert" substances, like powder of gypsum, have been used successfully for centuries for treating ailment with hyperproduction of heat described as "heat" or "fire" diseases [3], and seashell powder was used to treat mental disorders [3].

Even glucose solution can be an effective remedy. It can be used to alleviate slight hypoglycemia in order to avoid related health problems. Understanding this pathogenic mechanism led to use of glucose solution to treat bronchial asthma effectively before corticoid hormones were available [97–99] which is still practiced [100].

In general, without clinical trials for the "inert" substances used in the placebo there is no basic benchmark for other clinical studies, comparisons and scientific conclusions.

The attempts to carry out randomized, blinded, sham-controlled trials of acupuncture [101] or surgery [102] demonstrate adherence to modern requirements, with little or no understanding of the techniques and mechanisms that produce the therapeutic effects for these micro- and macrosurgical modalities.

Some odd findings have shown similar efficacy in sham and real surgery groups, thus further research and debate on the issue are required; one question is whether all "surgical diseases" actually need surgical treatment or whether some surgical cases can be cured by nonsurgical methods [103,104].

Interestingly in the current version of "modern medicine," any unknown therapeutic mechanism is commonly explained using the "placebo effect theory." This does not clarify the therapeutic mechanism, but it provides a safe way of saying "I don't know how it works."

12. Integration of tradition with modern scientific medicine

To improve healthcare, medical education should be the starting point. Along the path to becoming a doctor, medical students should be made of all the scientific medical modalities that have been applied throughout the generations—in theory and practice. The education should then be finished with the most recent achievements in the field of medical science.

Modern categorization of diseases should be developed into a systemic classification with the important labels like "*sthenic*" (excess) or "*asthenic*" (deficiency) and "hot" or "cold." This additional information is easily recognizable after a routine observation and examination of the patient. For example, expiratory dyspnea, or cough, during deep inhalation indicates "excess in the lungs" (*sthenic*), while inspiratory dyspnea, or cough during exhalation, indicates "deficiency in the lungs" (*asthenic*). Experiencing abdominal pain on empty stomach is an indicator of "deficiency of the stomach" (*asthenic*), whereas having abdominal pain after a meal indicates an "excess of the stomach" (*sthenic*). Excess and deficiency should require different therapeutic protocols.

Characteristics of diseases related to "hot" and "cold" syndromes can be easily recognized from the analysis of the patient's avoidance or preference for the "cold" and "hot" patterns, for example, inclination to cold or hot weather, certain types of food and beverage choices, or fondness for warm or light clothing.

It is highly desirable to develop simple protocols and equipment that can obtain objective criteria from these subjective signs. For instance, the ratio between heart rate and respiration can differentiate hot (> 5) or cold (< 5) syndromes [105]; and the duration of the "individual minute" can help to evaluate the adaptation or conservation of energy in the body [106–108].

It would be beneficial to find a scientific explanation for these universal patterns, which may be related to tissue respiration, contents of adenosine triphosphate and efficacy of its usage. But, even without this additional knowledge, doctors can still treat known or even unknown diseases and syndromes using "stimulation" or "sedation," "warming" or "cooling" methods or medicines accordingly.

The research protocols in modern pharmaceutical trials are too simplified, resulting in the inability to detect the therapeutic effects of the different methods and medicines used throughout the centuries [109–111]. To overcome this issue, various protocols of clinical trials should be developed for pure and complex medicines as well as pharmacological and nonpharmacological therapeutic modalities.

A doctor supervising a clinical trial pertaining to a specific field in medicine ought to have sufficient knowledge and practical experience in that field. If a researcher carries out a study in a field that is new to him, and obtains "negative results," they should be accepted as "valid results" only if the researcher has previous publications dealing with the same therapeutic modality with "positive results." Otherwise the lack of knowledge and inappropriate research protocol can cause clinical trials to result in negative conclusions. One cannot imagine that a novice surgeon would publish a first article reporting negative clinical cases, but it is quite common that a beginner published results reporting no efficacy of acupuncture, homeopathy or cellular therapy. Unfortunately in the medical community the insufficient experience of the researcher is not taken into account in regard to his unsuccessful clinical trial if study has been done according to the modern pharmaceutical standard.

During pharmaceutical clinical trials, it would be advantageous if descriptions of modern medicines include additional information on their "hot" and "cold" qualities, aside from their primary and secondary therapeutic effects. Describing medicines using their "hot" and "cold" qualities enables individualization of therapy, which decreases the risk of side effects even when various medicines and therapeutic modalities are utilized simultaneously. This was a common and compulsory practice during ancient times till the Middle Ages. The following two protocols exemplify this approach rather well:

In TCM, there is a group of antipyretic herbs which are prescribed according to the patient's symptoms: (1) initial fever with general cold feelings—*Herba Ephedrae* is recommended; (2) initial fever with general hot feelings—*Folium Mori Albae* or *Herba Menthae Haplocalycis*; (3) initial fever with intensive sweating or tension in the muscles—*Ramulus Cinnamomi Cassiae*; and (4) fever with alternating cold and hot feelings—*Radix Bupleuri* [3]. But in the case of severe feverish illness with various types of bleeding, or skin rashes—*Radix of Isatis tinctoria* should be applied [3].

Another example is the application of acetylsalicylic acid (aspirin), which is one of the ingredients in modern antipyretic pills. The natural source of aspirin is found in the cortex of the willow tree (*Salix alba*), known in TCM as Liu Shu Pi. The primary roles of Liu Shu Pi are to "cleanse the heat" and "promote the Yin" [112]. Thus, the consumption of Liu Shu Pi in the form of pills or decoction increases tolerance to external heat (hot weather, hot food or hot beverage) and reduces production of internal heat (exothermic chemical reactions). Based on this brief description, a TCM expert knows that only "hot" syndromes or inflammations resulted from the pathogenic "heat" should be treated with aspirin. Therefore, it is logical to use aspirin to prevent blood clot caused by the "blood stasis" due to the "heat." But aspirin should not be applied in most cases of rheumatoid arthritis with the symptoms of "cold" combined with "wind" and "dampness," or in cases of "cold" types of bronchial asthma, known as "aspirin asthma."

The above examples demonstrate the possibility of treatment based on common subjective symptoms. Deeper study of TCM allows the doctor to learn and understand the valuable medical knowledge used throughout the centuries.

Today, physicians can easily find logical modern explanations of ancient terms and theories [4,113,114]. Hence, a doctor, trained in classic modern education, can broaden his view on the therapy by studying the various fields in the art of natural healing. Just like studying foreign languages can help to gain more information, adding knowledge of "alternative" medicine to conventional medical science can expand the possibility of gaining insight related to the diagnosis, prophylaxis and treatment. It is known that in some mathematical equations, experts even use "imaginary unit" (i), which does not exist in nature, to find answers in cases of "unsolved" mathematical problems. Similarly, doctors can use terms and theories from ancient medical systems as a mathematical model to find a therapeutic protocol, even in the case of an unknown or incurable disease or syndrome.

For example, the TCM theory of channels and collaterals describes hidden relations between the internal organs and bones, muscles, fingers and toes, skin regions, zones on the tongue, and a certain area of the radial artery. So, a localized itch on the skin, ingrown nail, or creaking in the joints points to a related internal problem, thus allowing the physician to prescribe an effective therapy. In some cases, the location of the symptom could be quite a distance from where the problem started and the areas recommended for therapy [115,116]. Without this knowledge, even an experienced physician may observe the various symptoms throughout the body but not observe the connections and relations among them.

13. Conclusion

Throughout human history, prior to the Middle Ages, doctors and healers gathered and refined the knowledge inherited from previous generations. This growing practice was always considered the "classic modern scientific medicine" of the time. Despite natural and social disasters, mankind has survived until today, with its population in the rise—an evidence that at no time when medical knowledge was wrong or ineffective.

One can argue that various wild animals also survived even without healthcare, but actually they use their own primitive type of medicine [117] and their surviving depends mostly on the human expansion [118].

It is rationally acceptable for a physician to comply with the standard protocols of therapy immediately after graduating from medical school. As time progresses, a physician should become an expert using his own unique professional experience. He should become a "good doctor" who knows how to choose a "good method" or "good medicine" in specific cases, regardless of when that method or remedy was discovered. If it is a common cold or flu, a prescription of herbal tea may be sufficient [3]. For treatment of acrophobia, homeopathic *Argentum Nitricum* is one of the best choices [119]. The restless legs syndrome should be treated by acupuncture and herbal medicine [1,120]. For bronchial asthma attack, infusion of glucose solution could be quite effective [97–100]. But in the case of organ failure, hormone therapy [78–81] or transplantation of cells, tissue, or even the whole organ may be required [39,46,63].

A modern physician should remember that the primary goal of medicine has always been the same, now and a thousand years ago: "*I will use treatment to help the sick according to my ability and judgment ...*"(from Hippocratic Oath).

Conflict of interest

The author declares that he has no competing interests.

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https://archive.org/details/nano-peptides-range

Abstract: There is a short review on Organotherapy: from the Middle Ages to the present. Recent identification of nano-peptides opened a new page of the scientific research and further development of regeneration therapy with nano-extracts derived from the animal tissues and organs.

Therapeutic application of animal tissue and organs was described more than thousands of years ago in pharmaceutical books of various nations. So, in the 16th century Heinrich Cornelius Agrippa wrote, '*it is Well Known amongst physicians that brain helps the brain, and lungs the lungs*' etc. (1531).[1]

In the 'History of Drugs' (1748) we can find usual recommendations for that time: "the dried Liver and Bowels of a Wolf are recommended for the cure of all diseases arising from the liver and bowels; the dried Lungs of a Fox is esteemed excellent against coughs, asthma, wheezing, hoarseness, shortness of breathing, and all other diseases of the lungs".[2]

Usage of 'Organ specific remedies' became understandable and logic after discovery of G. B. *Morgagni* who established the anatomic concept of diseases originating from the certain organs (1769).[3] Theory of 'Cellular pathology' designed by Dr. R. Virchow was a further step for development of scientific view on the concept of 'cellular therapy' (1855).[4]

The greatest input in the cellular therapy was done by Dr. *Brown Sequard*. In the middle of 19th century he supposed: "*if into a man old or feeble the living cells of a young and vigorous being could be injected, why should he not vibrate in unison with this fresh life, which pervades him so intimately*?" After series of experiments on animals, Dr. Brown-Séquard presented his case whereby he injected himself with testicular extract derived from young dogs and noticed that his condition had improved tremendously, including general physical strength, brain function and even urination and defecation (1889).[5]

Since 1890s and until 1930s 'Organotherapy' and 'Cellular Therapy' were practiced widely in the mainstream of the medicine. When the active ingredients of the endocrine glands were identified and extracted in the pure forms, popularity of the cell therapy among doctors gradually declined (1950s).[6]

Nevertheless some of the experts in the cellular therapy (in Germany, France, Switzerland, Russia, etc) continued to use live cells or cell extracts as a part of their daily practice even after 1980s (*F.Scmidt*, 1983).[7] The leading argument suggested by those doctors was that cell therapy was not limited by the effects of hormones, and it could include substances not yet identified. Besides, some of the degenerative changes of the internal organs, brain, peripheral nerves, muscles and other tissues or undeveloped organs in childhood were not caused by hormonal deficiency so hormonal replacement therapy would not be effective. Therefore, this small group of "incurable" diseases and syndromes could be a niche for the further researches and practical application of cellular therapy.

Due to the scientific achievements of the last years a group of organ specific proteins and peptides were discovered. For analyses and identifications of the peptides they used LC-MS and SDS-PAGE tests. Recent studies demonstrated that nano-peptides even in small dose could contribute into the activity and regeneration of the corresponding organs (*P.Elistratov*; *M.Krasnov*, *et al.* 2018).[8,9]

Identification of nano-peptides opened a new page of the scientific research and further development of regeneration therapy with nano-extracts derived from the animal tissues and organs. Results of the laboratory tests are going to be presented.

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Application of Placenta Origin Peptides to Support Cellular Energy

M.Teppone

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Abstract: For many centuries and millennia doctors and healers used therapeutic ingredients extracted from minerals, plants and animals. Among the active remedies derived from animals placenta was one of the most popular. In the 20th century majority of specific functions and chemical ingredients of placenta were identified. But only now active proteins and peptides with molecular weight of about 10 kDa was revealed in the placental extracts. Hopefully this discovery will start a new era in the research and clinical application of organotherapeutic remedies, including placenta.

One of the first books which mentioned about therapeutic application of placenta,[1] was the *Natural History* written in the first century AD by Pliny, the Elder. For example, she-ass placenta was recommended to use to prevent epileptic seizure, and sheep and goat placenta were used for treatment of female complaints and diseases.[1] In the book *Drugs derived from the animal kingdom* by Dr. Sextus Placitus (4th century AD), it is recommended the usage of goat placenta with wine to expel placenta.[2]

In the traditional Chinese Medicine therapeutic application of placenta (*Zi He Che*) was known at least in the 8th century.[3] In the 16th century, various aspects of different medical remedies, including human placenta were described by Dr. Li Shi Zhen.[4] The property of placenta is described as 'sweet', 'salty', and 'warm'; it acts on Lung, Liver, and Kidney channels. The main effects are: 'warm the kidney and supplement essence, boost Qi, and nourish Blood'. It is prohibited to use in case of external pathogen and excess pattern (any types of acute disease) and cautions in patients with spleen deficiency leading to damp encumbrance and poor appetite.[5]

The first 'scientific report' dealing with the therapeutic application of placenta was prepared in 1898 by Dr. H. Iscovesco.[6] In 1902, Dr. L.Boucliacourt gave a review on the medical application of placenta in the past centuries in various countries. Dr. Boucliacourt reminded about the report presented by Dr. Iscovesco at the Congress of Internal Medicine, held at Montpellier in April 1898. A group of trial included more than a hundred female patients suffered from ovarian and tube lesions. Dr. Iscovesco used tablets corresponding to 0.25 g of fresh sheep placenta and reported positive results in majority cases.[7]

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[1] In the old literature *placenta* could be mentioned as *secundinæ, after-birth*, *womb-cake*, *womb-liver*, *pancreas of the matrix*, etc.

It was an important fact in the medical history that since 1900 placenta became regarded as one of the endocrine glands of the pregnant woman.[8] Since the beginning of the 20th century various forms of the products derived from human or animal placenta were manufactured and applied as a part of 'organotherapy', 'cellular therapy' or 'tissue therapy'.[9-11]

The western trained doctor can evaluate indication for placenta products based on the contains of uric acid in the blood. Uric acid correlates to the pattern of 'Heat' in TCM; if uric acid is higher than mid of the norm it is a counter indication for placenta origin products; in that case even small dose of the product should be taken (if it is taken) with great care. Hot feeling in the face, especially afternoon could be the first symptom of overdose.

Based on TCM view on the placenta one can assume that inside the human body active peptides derived from the placenta can change tissue metabolism in the direction of increasing heat and energy (ATP) production as well as uric acid accumulation.

The resent study demonstrated, that high serum uric acid level is a protective factor of Alzheimer's disease.[12] We also can assume that various pathological conditions which are associated with low level of uric acid could be indications for placenta origin products. Additional effects could be obtained due to the various ingredients included in the complex product. Uric acid level in the blood possibly could be used to monitor efficacy of the placenta origin products application.

For identification of nano-peptides derived from sheep placenta LC-MS and SDS-PAGE tests were used. Some known and unknown peptides were discovered. *Profilin*, *Acyl-CoA-binding Protein*, *Small Muscle Protein X-linked*, *Ubiquitin*, *Thymosin beta-4*, etc. are among them. Results of the laboratory tests are going to be presented.

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Review Article

Extremely High-Frequency Therapy in Oncology

Mikhail Teppone, MD, and Romen Avakyan, PhD

Abstract

Objective: This article represents a review of the literature, mainly from Russian sources, dealing with the therapeutic application of low-intensity electromagnetic radiation in the millimeter band applied to experimental and clinical oncology.

Method: At the early stage of these studies, efficacy and safety of millimeter electromagnetic radiation (extremely high frequency [EHF]) was proved for various types of malignant tumors. The majority of the further studies demonstrated the high efficacy and safety of millimeter wave radiation in treating patients suffering from both benign and malignant tumors.

Results: Developments led to treatment on skin melanoma, cancer of the ear–nose–throat, bowel and breast cancer, cancer of the uterus, lung, and stomach, solid tumors, as well as lymphoma. The main indications for this therapy are (1) preparation prior to radical treatment; (2) prevention and treatment of side-effects and complications from chemotherapy and radiotherapy; (3) prevention of metastases, relapses, and dissemination of the tumor; (4) treatment of the paraneoplastic syndrome; and (5) palliative therapy of incurable patients.

Conclusions: In spite of the fact that not all mechanisms underlying effects of EHF therapy are known as yet, this therapeutic modality has been shown to have great potential in clinical oncology from studies performed in Eastern Europe and Russia.

Introduction

SINCE THE MIDDLE OF THE 1960s the biological and medical effects of low-intensity electromagnetic radiation (EMR) of the millimeter (MM) spectrum of waveband were studied in various countries including the United States, Canada, France, Germany, and the former Soviet Union.[1–5] As a result of these studies, a new therapeutic method translated from Russian as "extremely high-frequency (EHF) therapy" was designed and approved for clinical application in the countries of the former Soviet Union.[6–8] This article surveys the clinical aspects of this work in oncology. Both authors of this article were involved in this study while in the former Soviet Union.

Millimeter waves come between infrared radiation and centimeter radio waves and include frequencies from 30 GHz to 300 GHz (1 GHz = 10^9 oscillations per second) corresponding to wavelengths from 10 to 1 mm. The power density of this therapy used in medicine varies from 1 to 10 mW/cm^2 or even less, and it does not induce heating effects of an irradiated skin surface.

Therapeutic Generators Applied for Extremely High Frequency (EHF) Therapy

One of the first "therapeutic frequency" 42.19 GHz (wavelength is 7.1 mm) was discovered by the experiments with the cells and mice.[9] Later nonthermal effects of this frequency were confirmed by experiments with yeast.[3] Theoretical supposition about importance of the oxygen absorption lines in the region of 60 GHz was the basis of developing the device with the main frequency 60.12 GHz (wavelength is 4.9 mm). Nevertheless, it is difficult to say whether can some frequencies can be claimed to be universally therapeutic frequencies, nor is it is correct to extrapolate results obtained on the cells and animals for the clinical application.

Special medical generators of MM EMR were developed for EHF therapy including "Jav-I," "Artsakh," "Luch-EHF," and so on. "Jav-I" (4.9 mm): frequency of the coherent radiation is 60.12 ± 0.15 GHz; output power is up to 20 ÷ 25 mW; frequency modulation is ± 50–150 MHz. "Jav-I" (5.6 mm): frequency of the coherent radiation is 53.53 ± 0.15 GHz; output power is up to 20 ÷ 25 mW; frequency modulation is ± 50–150 MHz. "Artsakh": frequency of the coherent radiation is 60 ± 1 GHz; output power of the coherent radiation is 0.05 ÷ 5.0 mW; frequency band of the noise-like radiation is 42–95 GHz; spectral density of the noise radiation is 10^{-18} W/Hz (30 dB/kT$_0$); amplitude modulation is 1 ÷ 99 Hz. "Luch-EHF" (7.1 mm): frequency of the coherent radiation is 42.19 ± 0.05 GHz; output power is 0.5 ÷ 2.0 mW.

Acutech International Inc., Toronto, Ontario, Canada.

Application of EHF Therapy in Experimental Oncology

Studies of biological effects caused by electromagnetic radiation have shown that exposure of living organisms to *centimeter-wavelength* radiation before exposing them to a lethal dose of *ionizing radiation* (LD50) reduced their mortality by 50% or more.[10,11] Similar effects were observed when a low-intensity *millimeter-wavelength* radiation was initially applied.[9,12] On the basis of further experiments, it was confirmed that low-intensity MM EMR did not accelerate the tumor growth and provided a hemoprotective effect when applied in combination with chemotherapy or X-ray therapy.[13–17]

EHF Therapy in Clinical Oncology

Clinical research had shown that EHF therapy did not stimulate the growth of either the primary or metastatic tumor,[18–21] and on the contrary, it could suppress its proliferate activity.[15] EHF therapy in oncology was used as a monotherapy for treatment of benign tumors or as a palliative therapy for pain relief and reducing intoxication syndrome. In all other cases, EHF therapy can be applied in combination with surgery, chemotherapy, or X-ray therapy. EHF therapy was used in treatment of gastric polyps and uterine myoma, benign skin tumors and testicular tumors, local fibroadenomatosis and fibroadenoma of mammary gland, malignant skin melanoma, cancer of the stomach or mammary gland, ovarian cancer, carcinoma of the cervix and uterine cancer, cancers of esophagus, lung, bowel, and others.[20–29]

EHF therapy in surgery

In the presurgery period, this EHF therapy (MM-EMR) treated a number of accompanying diseases and thus reduced the risk of surgical intervention. Its application in pre- and postsurgery periods reduced the likelihood of postsurgery complications such as suppurative conditions, hemorrhagic and atonic syndromes, and intensified the healing process of postoperative and postexcision wounds. This treatment stopped the pain syndrome successfully and made it possible to reduce the dose or to abolish the need for narcotic and non-narcotic analgesics. In a number of cases the MM-EMR therapy prevented the development of relapses and metastases.[20,24,25,28–31]

Hemostimulative and hemoprotective effects of EHF therapy

Application of the MM-EMR therapy in a group of patients with initially low content of leukocytes in peripheral blood increased their level to a value making the required chemotherapy possible.[21,30,31] While preserving the antitumor effect of chemotherapy (5-fluorouracil, cyclophosphamide, methotrexate), MM-EMR significantly reduced their toxic effects such as nausea, vomiting, diarrhea, and weight loss, allowing a full-scale treatment without changing the chemotherapy terms or rate. Leukocyte count in the peripheral blood stayed within normal limits.[19–21,32,33] A study of the functional activity of segmented neutrophils by means of the spontaneous rosette test revealed decreasing rosette-forming cells (before treatment: 3.42 ± 0.21%, after treatment: 2.06 ± 0.26%) that pointed to the high activity of these leukocytes, and, likely, explained the mechanism of releasing the toxicity and side-effects observed during chemotherapy.[33] Similar results were obtained when MM-EMR therapy was combined with X-ray therapy. MM-EMR therapy also reduced side-effects of X-ray therapy such as stomatitis, esophagitis, pulmonitis, cystitis, and rectitis, which made it possible to conduct the full-scale course of combined treatment, improving its results and cutting the term from 18.0 ± 4.0 days to 6.5 ± 1.5 days.[25]

Action of MM-EMR therapy on the main symptoms of malignant tumors

In the group of patients suffering from various malignant tumors, MM-EMR therapy could reduce the intensity or completely stop the main pathogenic mechanisms of the neoplastic disease.

Pain syndrome is one of the most important and common symptom of any tumor. The intensity of the pain increased at the latest stages of the disease. After MM-EMR therapy, 94% of patients had analgesic effects varying in degree. The initial analgesic effect took place during the first therapeutic session and a steady analgesic effect occurred after 2–3 sessions of the MM-EMR therapy. After 10–20 sessions, all patients reduced the dose of remedies, or completely stopped the remedies.[14,20,31,33] When patients had any neoplastic process including primary uterine cancer, they had various types of T-cellular immune deficiency manifesting through the reduction of the lymphocytes population, as well as the reduction of the various subpopulations of T-lymphocytes. After the MM-EMR therapy, an increase in T-cells, especially T-helpers and T-suppressors, was observed. Before MM-EMR therapy, the total population of T-lymphocytes was 40.0 ± 3.1%; T-"active" lymphocytes comprised 23.0 ± 2.1%; T-helpers comprised 27.2 ± 1.8%; T-suppressors comprised 13.1 ± 1.1%. After MM-EMR therapy, the total proportion of T-lymphocytes became 47.2 ± 3.4%; T-"active" lymphocytes became 28.0 ± 1.8%; T-helpers became 31.0 ± 3.6%; T-suppressors became 16.0 ± 2.0%. However, the MM-EMR therapy did not change the amount of T-lymphocytes in a control group of healthy volunteers.[15,31,34] Patients with carcinoma of the cervix had noticeably suppressed interferon status, especially at stages II and III of the disease. After MM-EMR therapy, the γ-interferon synthesis increased from 20 to 40 units per milliliter to 95 units per milliliter. In the first stage of disease, the γ-interferon synthesis increased to the normal levels (120 units per milliliter). Among the healthy people, the ability of mononuclear cells in peripheral blood to produce γ-interferon had not been changed by the MM-EMR exposure.[15,30,31,35] Thus, MM-EMR therapy provides immunostimulating effects only in the case when suppression of the immune system took place and did not influence the normal immune status. Leukopenia is one of the usual counterindications for starting both chemotherapy and X-ray therapy. Suppressed leukopoiesis can be activated by the EHF therapy with fixed or individual therapeutic frequencies. Acupoints and reflexogenic zones of the sternum, epigastrium, ethmoidal, occiput, and various other regions were applied. In both methods, the number of leukocytes in the peripheral blood increased from 2500 before treatment to 4000–4500 after treatment. As a result of the MM-EMR therapy, almost all patients could be treated by means of chemotherapy or X-ray.[19,30,31,35]

Preventive application of MM-EMR therapy in oncology

Study of the main mechanisms of tumor pathogenesis allowed application of MM-EMR therapy to reduce the risk of the cancer and prevent various neoplastic diseases from occurring. Tumor tissue secreted the substances that increased blood coagulation and lowered fibrinolytic ability. After MM-EMR therapy, general coagulability potential of the blood, including such factors as fibrinogen, fibrinogen B, prothrombin, clotting time, and aggregability of thrombocytes, decreased by more than 30%.[31] Application of the MM-EMR therapy also restored the ability of mononuclear cells in the peripheral blood to produce γ-interferon and depressed the growth of experimental tumors. This fact may likely explain the therapeutic activity of MM-EMR therapy during treatments of neoplastic diseases of the ovaries or mammary gland, or of lymphoepithelioma and lymphogranulomatosis (Hodgkin's disease), etc.[31]

Application of MM-EMR therapy for terminally ill patients

In applying MM-EMR therapy to terminally ill patients, the following problems must be solved:

1. Improvement of the "quality" of health due to pain relief, and sedative, detoxification, and psychotherapeutic effects;
2. Life prolongation due to improvement of the specific (anticancer) and nonspecific resistance of the patient's body: stimulation of the cells and humoral components of the immunity, treatment and prophylaxis of complications and accompanied diseases;
3. Improvement of the patient's condition to transfer the patient from the "incurable" group to the group where different methods of combined therapy could be applied.

In spite of the lethal outcome and poor prognosis, one should still analyze treatment results in cases of advanced forms of cancer. For instance, in 39 patients suffering from malignant tumors of stage III-IV in various locations, some had undergone palliative surgery, chemotherapy, or radiotherapy. All 39 patients received one or more courses of MM-EMR therapy with individual therapeutic frequencies. This method is named "microwave resonance therapy" or MRT.[36]

The first group ($n=4$) included patients who died during the first month of observation. They were already in grave condition and suffered from troublesome pain. Examples of these conditions included obturated bowel tumor at the sigmoidostomy; mediastinal tumor with growth into the trachea, bronchi, vessels, and sternum; stage IV stomach carcinoma accompanied by cachexia and ascites; and pancreatic cancer with metastasis to the abdominal viscera and surrounding tissue. After EHF/MRT, patients noticed improvement of their health, relief from the pain syndrome, restoration of their appetite, and improved sleep.

The second group ($n=10$) included patients who died during the first 6 months of observation. They had cancer of the pancreas, liver, tongue, esophagus, lung, or bowel. As in the previous group, all patients noticed improvement of their health, restoration of their appetite, and improved sleep. Stable relief of pain allowed most of these patients to stop taking the analgesic medicines. There were no signs of cancer destruction. Symptoms such as dyspnea, cough, hemoptysis, choking, difficult swallowing, and others were relieved or even stopped.

The third group ($n=5$) included patients who survived from 6 to 12 months. It included cancer of the pancreas, papillosphyncter, lung, and ovary. The effect of EHF therapy in this group was the same as in the second group.

The fourth group ($n=17$) consisted of patients who were still alive when results of the observation were published in 1997 and had cancer of the mammary gland, pancreas, prostate, retroperitoneum, lung, or sigmoid. In this group the pain syndrome was relieved almost completely and there were no signs of cancer progression.[36]

The study presented above resulted in the possibility to make the following conclusions:

1. Positive clinical effects of treatment with the MM-EMR therapy were obtained in 92% of cases; improvement of the "quality of life" could be achieved in 82% of patients;
2. MM-EMR therapy provides relief and can stop the main clinical syndrome accompanying advanced cancer cases; efficacy of the MM-EMR therapy was the same as in the cases of conventional medicines application;
3. After EHF therapy, the cancer may lose features of its "malignancy" such as metastasis and penetration into the surrounding tissues and organs.[36]

MM-EMR Therapy of Malignant Tumors

In the case of malignant tumors, MM-EMR therapy was used in combination with surgery, chemotherapy, and/or X-ray therapy. The exact methods of treatment depended on the character of radical therapy.

Treatment of skin melanoma

MM-EMR therapy was used after the laser surgical removal of the primary tumor. The ethmoidal labyrinth area was exposed to MM-EMR for 30 minutes. The full treatment course included four phases of the therapy consisting of 10–15 sessions (30 minutes each) performed daily. The first phase started immediately after the surgery; the second phase started 1 month after the first phase; the third phase started 3 months after the second phase; the fourth phase started 6 months after the third phase. Relapse and metastases rates reduced independently of position and depth of the invasion area. A 5-year observation period revealed local and remote signs of tumor generalization in the clinical trial group in only 41.1% of the cases, whereas in the control group these complications have been revealed in 71.5% of cases.[21,25,37]

Treatment of ear, nose, and throat cancer

The treatment method described above was used after surgery. In the group receiving MM-EMR therapy, the number of suppurative inflammation cases was reduced by more than half, while the number of patients whose wounds were healed by the first intention increased. Remote results have shown that relapses and metastases had been reduced by more than half (from 29.1% to 12.0% and from 43.7% to 22.0% correspondingly).[25]

Treatment of bowel cancer

In this trial, there were two groups of patients suffering from bowel cancer. In the clinical trial group, patients received both surgery and MM-EMR therapy. In the "control" group, patients received surgical therapy only. In the clinical trial group, wounds healed in 77.7% of the cases by the *first intention*, whereas in the "control" group the wounds had healed by the *first intention* in 30.4% cases only. Relapses of the tumor took place in 23.3% cases in the clinical trial group, whereas in the "control" group it was 50.0%. Metastases took place in 23.3% cases in the clinical trial group, whereas in the "control" group this was 50.0%.[25]

Treatment of breast cancer

Patients who have stages IIb and IIIb of diseases and who were undergoing chemotherapy were treated with the MM-EMR therapy. The course consisted of 14–15 sessions (30 minutes each) performed daily. Three (3) sessions were conducted prior to chemotherapy, two sessions during chemotherapy, and three sessions after chemotherapy. Results of the trial were as follows: chemotherapy when applied in combination with the MM-EMR therapy could be done without toxic side-effects in 95.1% of patients (79.2% in the control group). The number of monocytes and lymphocytes in peripheral blood did not reduce. The quantity of leukocytes was less than 3000 in only 4.5% of cases (18% in the control group) and less than 3500 in only 13.6 % of cases (32% in control group). As a result of the MM-EMR therapy, hemopoietic stability and good tolerance to chemotherapy were achieved and there were no reliable data that indicated bone marrow suppression.[19,20]

Treatment of the patients with uterine cancer (the second stage)

The combined treatment included surgery, with the MM-EMR therapy beginning 3–8 days postsurgery, and a 4–5-week course of radiotherapy beginning 15–16 days postsurgery. Those patients who received MM-EMR therapy had immunity-protective and immunity-modulating effects with preservation of T-helpers lymphocytes both after surgery and the X-ray therapy.[37–39]

Treatment of patients with lymphoma and solid tumor

Patients suffering from lymphoma and solid tumors had received X-ray therapy or combined therapy. To stimulate hematopoiesis, the MM-EMR generator type "Jav-I" was used; 7–10 minutes of EHF exposure was carried out on both the sternum and occiput zones or 30 minutes of EHF exposure was performed to the sternum area only. Additionally, to treat the complications of X-ray therapy or combined treatment, the local application of MM-EMR had been used also. A course of the MM-EMR therapy consisted of 5–15 sessions. After the MM-EMR therapy, 60% of patients noticed improvement of their condition. The objective of changing the parameters of the peripheral blood was already obtained after 6–8 sessions. Local application of the MM-EMR therapy resulted in the release or disappearance of edema and pain after 6–10 sessions. Quick epithelialization of the damaged regions was achieved also.[40]

Thus, the major positive effects of MM-EMR therapy in combined treatment of malignant neoplasm were as follows:

1. The reduction of postsurgical complications;
2. Less expressed side-effects of chemotherapy and X-ray therapy;
3. Hemoprotective and immunity-modulating effects;
4. Reduced number of relapses and metastases.

Indications for MM-EMR Therapy in Oncology

Indications for MM-EMR therapy in a group of oncological patients include:

1. Preparation for radical treatment;
2. Prevention of toxic effects of radiotherapy as well as chemotherapy;
3. Treatment of the complication accompanying or following radical treatment;
4. Combination of EHF therapy with other synergetic methods of treatment applied in oncology including laser therapy, narcotic and non-narcotic analgesic remedies;
5. Treatment of the paraneoplastic syndrome;
6. Palliative EHF therapy of incurable patients;
7. Prevention of metastases, relapses, and dissemination of the tumor.

No direct contraindications of MM-EMR in oncology are known so far. Thus, according to the indications given above, MM-EMR therapy can be recommended for almost any oncological patients.[15,20,25,33]

Discussion

After the series of positive results, some of the authors failed to observe frequency-specific or "resonance" effects of the low-intensity MM-EMR. They declared that results obtained in the Soviet Union have not been reproduced in the laboratories of Europe and North America.[41,42] (One of the explanations of unsuccessful experiments is a standard paradigm of the "precise biological experiment" that does not work in the field of radiofrequency bio-effects[43]). Due to the "pessimistic" conclusion, a majority of the studies had been delayed or even stopped. Nevertheless, extensive studies that were continuing in Russia, Ukraine, Byelorussia, and Baltic countries established this new complementary therapeutic method that can be applied safely and effectively in oncology and other fields of medicine.

It is believed there are enough positive therapeutic results to propose that the application of the MM-EMR therapy is a very powerful complementary tool in treating onclogical and other intractable diseases. Nevertheless, the final conclusion regarding this issue can be made only after appropriate clinical trials take place worldwide. The writers consider that MM-EMR therapy is an inexpensive and noninvasive modality that can be used in the treatment of various diseases, including those whose etiology and pathogenesis are unknown.[8]

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Disclosure Statement

No competing financial interests exist.

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Address correspondence to:
Mikhail Teppone, MD
Acutech International Inc.
1057 Steeles Avenue, West
Toronto, Ontario M2R 3X1
Canada

E-mail: mikhail.teppone@gmail.com

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Original Article

Modern Interpretation of Traditional Chinese Medicine Theory

Mikhail Teppone, MD[1] and Romen Avakyan, PhD[2]

ABSTRACT

The terms and theories applied in Traditional Chinese Medicine (TCM) are interpreted in this article. *Qi* can be imagined as a universal measuring and comparison unit as well as a common managing parameter in a cybernetic sense; the terms *Heat* and *Cold* are suggested as an evaluation of heat production by the patient's body or his/her organs; the theory of stress designed by Selye is compared with Zhang's theory of 6 Channels. Finally, theories used in TCM are explained to be a mathematical model, showing the general physiological and pathological processes taking place in the human body.

Key Words: TCM Theory, Qi, Tao, Yin, Yang, Five Elements, Heat, Cold, Excess, Deficiency

INTRODUCTION

Do we need to preserve the original Traditional Chinese Medicine (TCM) lingo or it is possible to match the TCM terms with their equivalents in modern medicine? Can a Western physician apply such terms as Yin and Yang, Five Elements, Excess or Deficiency, and Heat or Cold in his/her daily acupuncture practice?

In this article, we attempt to answer these questions and suggest reasonable explanations of the main terms and theories applied in TCM.

ACUPOINTS, CHANNELS, AND ORGANS

The main aspects of Acupoints, Channels, and Organs have already been described.[1,2] We repeat our idea: it is assumed that through the theory of *Channels and Collaterals* that ancient Chinese physicians described physiology and pathology of intercellular spaces as well as body cavities, and by the theory of *Zang and Fu Organs*, they described cellular physiology and pathology.

(The) system of Acupoints is a part of the Channels, i.e., it is a part of intercellular spaces. Due to morphologic and functional complexity of acupoint areas, it provides interaction between internal body environments with its external surrounding.

QI OR ENERGY

It is difficult to translate the term *Qi* and many different translations have been proposed, none of which approximates the exact essence of Qi.[3] It can assume different manifestations and can mean different things in various situations. Usually, it is impossible to understand the meaning exactly without the text where the word, Qi, is applied. Sometimes, Qi is translated as "air," "energy," and "living force," or functional activity is described by means of Qi. At the same time, it is both material and nonmaterial. It can be associated with either "energy" or "form." Hence, it has a quality described by quantum physics as *corpuscular-wave dualism.*

A name of the Qi depends on context and classification (or system of coordinates) that is applied; for example *Yang Qi* and *Yin Qi, Wei Qi* and *Nei Qi, Qi of Lung, Qi of Liver, Qi of Upper Jiao*, etc. Accordingly, one and the same "Qi" can be named by a different manner according to its exact function.

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[1] Medical Acupuncture, AcuTech International, Inc, Toronto, ON, Canada.
[2] Radio-Physicist, Coloyaro-2000, Moscow, Russia.

We assume that ancient Chinese physicians understood the complexity of the human being and limitations of our 3-dimensional space. Ignoring theories about the multi-dimensional world, we can only analyze dependence of 1 parameter on 1 or 2, simultaneously $\{Y = f(x, z)\}$. Therefore, the ancients proposed an idea, similar to the cybernetic model designed by Beer, by which any complex system can be managed by a sole controlling parameter.[4]

In addition, Chinese doctors suggested relative and universal measuring units such as "percentages" and gave it a name, "Qi." By means of Qi, one may compare *non-comparable* signs and phenomenon—for example, height, weight, color, and time, condition of health or disease, and various therapeutic methods. This type of comparison is not made in quantitative but rather in qualitative characteristics, such as "more," "much more," "less," "much less," or "equal."

The term *Qi* is also applied to claim the unity and similarity of existence, to point out their interactions, and to unite them into 1 universe.

EXCESS AND DEFICIENCY, HEAT AND COLD

In the 18th century, a famous Scottish doctor, William Cullen, and his follower, John Brown, considered that there were only 2 types of diseases: *asthenic* and *sthenic* diseases. In the case of *asthenic* diseases, they recommended invigorative treatments such as warmth, fomentation, meat, spicy food, and wine. For *sthenic* disease, they recommended sedative treatments such as bloodletting, emetic and depletive medicines, clysters, remedies that contained opium or atropine, etc.[5,6]

At the close of the 19th century, Russian physiologist Vedensky studied the physiology of the damaged nerve. He found that the process of inhibition had several phases: 1 of the phases was named as a "paradoxical phase of parabiosis." In this phase, reaction of the damaged nerve was satisfactory in case of exposure to the weak electrical stimulus, but application of the strong electrical stimulus induced aggravated inhibition.[7]

Later, another Russian physiologist, Ukhtomsky, found that both the process of excitation and the process of inhibition had similar natures. He also showed an unusual excited condition of the brain that was named as a "dominanta." This stable excitation focus was reinforced by any additional stimulus from the entire body and only a very strong stimulus could destroy or sedate "dominanta."[8]

Specifically, the living system can have conditions of high or low activity. In the first case, it requires reduction of activity by strong stimulus, but the latter case requires reinforcing by weak stimulus. Application of improper intensity of stimulus can result in aggravation of the initial problem.

In TCM, pathologies are differentiated on the base of the Qi condition: therefore, disease can have relative Excess of Qi or relative Deficiency of Qi.

If a patient has a cough, it may mean that there is a disease of the lung. If the cough is aggravated by inhalation, then it means that there is an *Excess* condition of the lung. If cough is aggravated by exhalation, then it means that there is a *Deficiency* condition of the lung. In case of Excess, one should sedate points of the Lung channel and in case of Deficiency, one should reinforce points of the same channel. Neither Western diagnosis nor results of laboratory analyses and x-ray examination are important for the treatment by TCM methods because of the fact that they do not point on the condition of *Excess* or *Deficiency*.

Hence, Qi is parameter X in the equation $\{Y = f(x, z)\}$, where Y is the condition of the patient's body or his/her organ and Z is as a particular case of Excess and Deficiency. If any Heat adding to the patient's body results in aggravation of symptoms, then it means that there is a *Heat* condition; if any Cold adding to the patient's body results in aggravation of symptoms, then it means that there is a *Cold* condition. We can assume that "Heat" and "Cold" describe intensity of heat production; i.e., Z describes predominance of exothermic or endothermic chemical reactions in the patient's body. Therefore, if exothermic reactions prevail, then disease has Heat symptoms and requires "cleaning the Heat." On the contrary, if endothermic chemical reactions predominate, then disease has Cold symptoms and requires warming therapy.

Consequently, in TCM diagnosis, it is necessary to determine Excess or Deficiency for disease of channels and collaterals $\{Y = f(x)\}$, and both *Excess* or *Deficiency* and *Heat* or *Cold* for disease of organs $\{Y = f(x, z)\}$.

THE TAO, YIN AND YANG, FIVE ELEMENTS

Those who know (the TÂO) do not speak of it; those who speak of it do not know it.[9]

Nevertheless, whoever wants to imagine a mathematic model of the TÂO should try to divide "1" by "0."

We also recognize the following ideas in the TÂO:

- One truth: there is only 1 true way and there is no choice; illusion of choice means lack of understanding or knowledge, as well as breach of the law.
- Pre-existence: everything was in existence from the very beginning; there was no evolution, but there is realization of the preexisted pattern.
- Holistic approach: TÂO creates interconnected parts Yin and Yang; "separation of Yin from Yang results in death," so, if we study a part of the whole and omit at least 1 connection with other parts of the whole, it is not a part of the initial *Whole* any longer, but it is already a new smaller Whole.

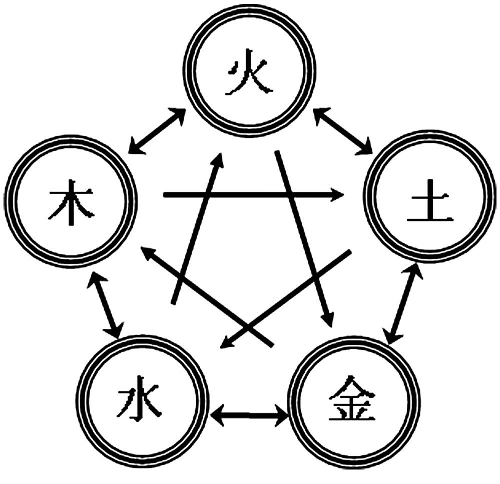

FIG. 1. There is a final scheme of interaction between elements of the system: this scheme looks like an algebraic equation where figures are replaced by symbols.

Yin and *Yang* is a binary system of calculation and comparison. It can describe all variety of the world as well as simplifying the extremely complex problem down to the choice of "yes" or "no"; for example, a complex numerical series, 1000110001001000010010000101, can be simplified to inequality $\{0 > 1\}$.

Interactions between Yin and Yang are not antagonistic completely as $[-1]$ and $[+1]$, but there are phase transformations that are realized in the law of *Five Elements.* This law has the following initial conditions:

$$(1)\ \uparrow\alpha \Rightarrow\uparrow\beta;\ \uparrow\beta \Rightarrow\uparrow\lambda;\ \uparrow\lambda \Rightarrow\uparrow\gamma;\ \uparrow\gamma \Rightarrow\uparrow\mu;\ \uparrow\mu \Rightarrow\uparrow\alpha,$$

$$(2)\ \downarrow\beta \Rightarrow\downarrow\alpha;\ \downarrow\alpha \Rightarrow\downarrow\mu;\ \downarrow\mu \Rightarrow\downarrow\gamma;\ \downarrow\gamma \Rightarrow\downarrow\lambda;\ \downarrow\lambda \Rightarrow\downarrow\beta,$$

$$(3)\ \uparrow\alpha \Rightarrow\downarrow\lambda;\ \uparrow\beta \Rightarrow\downarrow\gamma;\ \uparrow\lambda \Rightarrow\downarrow\mu;\ \uparrow\gamma \Rightarrow\downarrow\alpha;\ \uparrow\mu \Rightarrow\downarrow\beta,$$

$$(4)\ \downarrow\alpha \Rightarrow\uparrow\lambda;\ \downarrow\beta \Rightarrow\uparrow\gamma;\ \downarrow\lambda \Rightarrow\uparrow\mu;\ \downarrow\gamma \Rightarrow\uparrow\alpha;\ \downarrow\mu \Rightarrow\uparrow\beta,$$

where 'α' was named 木 (wood), 'β' $\sim$ 火 (fire), 'λ' $\sim$ 土 (earth), 'γ' $\sim$ 金 (metal), 'μ' $\sim$ 水 (water); and symbol $[\uparrow]$ means *reinforcing*, $[\downarrow]$ means *sedating*, and $[\Rightarrow]$ means *results of interaction.*

From the mathematic model point of view, "5" is the least number of Elements in the dynamic system with the both direct and indirect either reinforcing or sedating interactions. This system can have 6, 7, or more Elements, but not less than 5 (Figure 1).

ETIOLOGY OF DISEASE

In both modern Western medicine and TCM, etiologic factors can be divided into 3 main groups: genetic disorders, emotional stress, and environmental or external factors.

Nevertheless, description of external factors in TCM raises many questions such as, "What does Wind mean?"

We assume, based on their huge practical experience, that doctors in ancient China analyzed all symptoms and systemized them into 5 types of reaction. One of the possible acceptors of the helio-cosmic factor changes can be *water molecules* inside and outside of the human body.[10]

The ancients also drew parallels between changes of the weather and symptoms of patients, and developed special terms to describe those interactions: *Heat, Cold, Wind, Dampness* and *Dryness* (Figure 2).

By means of the terms "Heat" and "Cold," they described heat production of the patient's body; by means of the terms "Dampness" and "Dryness," they described water metabolism and the capacity of the body to accumulate water molecules. By means of the term "Wind," they estimated the speed of changes of various parameters occurring in the patient's body.

PATHOGENESIS OF ACUTE DISEASES

About 1,800 years ago, Chinese physician Zhang Zhongjing described the main symptoms and phases of acute disease evolution in his "Treatise on Febrile Diseases Caused by Cold" (*Shanghan Lun)* (Figure 3), and also wrote his prescription for therapy.[11,12] In the beginning of the last century, Selye again paid attention to the general symptoms of acute diseases and published results of his study."[13]

According to both theories, any acute disease starts from activation of body resistance. Zhongjing described this

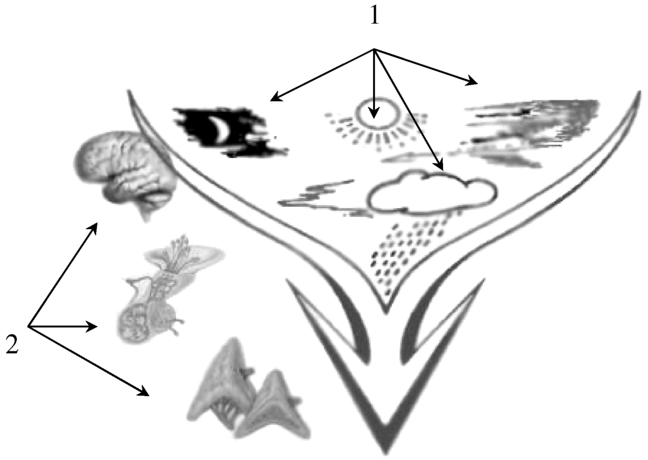

FIG. 2. External factors that act on the human body from outside: (1) Sun, moon, stars, and other space bodies act on the atmosphere resulting in changes of the weather; (2) Organs and systems that take part as defense to protect the body from external factors.

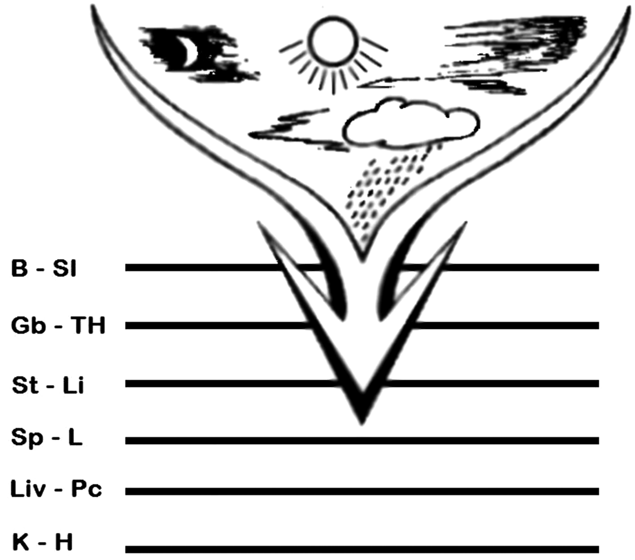

FIG. 3. The theory of 6 Channels, designed by Dr Zhang. In the main Classic books on acupuncture *Shao Yin* (K-H) is on the 5th level and *Jue Yin* (Liv-Pc) is on the 6th level; in the books of .Nghi *Shao Yin* (K-H) is on the 6th level and *Jue Yin* (Liv-Pc) is on the 5th level.[14]

phase by means of disorders of Yang Channels. Selye and other modern scientists believe that acute phase is characterized by activation of the sympathetic autonomic nervous system, increase of corticosteroids production, and intensive consumption of carbohydrates.[14]

At the late stage, symptoms of exhaustion can be observed. Zhang described this phase by means of disorders of Yin pairs of Channels. In modern studies, this exhaustion phase of acute disease is characterized by decreasing parasympathetic autonomic nervous system activity, as well as insulin production, and transformation of metabolism from carbohydrates to lipids.[14]

Thus, both Drs Zhang and Selye described the same idea of acute diseases evolution, but they presented their theories in different verbiage.

In 1988-1990, we applied solely extremely high-frequency (EHF) puncture[15] to treat 44 patients with exacerbation of peptic (duodenal) ulcer. Clinical manifestations in this group of patients were differentiated on the basis of Zhang theory of 6 Channels. In our study, 3 patients had symptoms of the Shao Yang stage, 13 patients had Yang Ming stage, 3 patients had Tai Yin stage, 20 patients had Jue Yin stage, and 5 patients had symptoms of the Shao Yin stage.

After 2 weeks of treatment, healing of ulcers was achieved in 29 cases (65.9% ± 7.2%). If patients had Yang Ming syndrome, healing of the ulcer was achieved in 12 cases (92.3% ± 7.7%). If patients had Jue Yin syndrome, including those who had various complications of peptic ulcer in anamnesis, healing of the ulcer was achieved in 12 cases (60.0% ± 11.3 %).[16]

MECHANISMS THAT UNDERLIE THE BASE OF THERAPEUTIC EFFECTS OF ACUPUNCTURE

Modern studies have formed a base of scientific understanding of the biological and therapeutic effects of acupuncture, moxibustion, electroacupuncture, and other modalities.[17–19]

Usually, anti-inflammatory, anti-swelling, anti-allergic, pain relief, and other effects are claimed. It is believed by many that by using acupuncture, one might stimulate or modulate components of the immune and endocrine system and normalize microcirculation and metabolism. Recently, attention has been paid to neuropeptides, including endorphins and encephalin.

Analysis of various modern studies concludes that in any case, only the normalizing effects accompany any successful treatment. If the patient initially has increased parameters, then we wait for their decreasing; if the patient initially has decreased parameters, we hope to achieve their increasing. Usually, treatment does not change parameters that were at a relative norm.

The more the initial change, the more improvement after treatment may be obtained. If a patient has a small initial change of some parameters, then improvement after treatment may not be statistically proved.

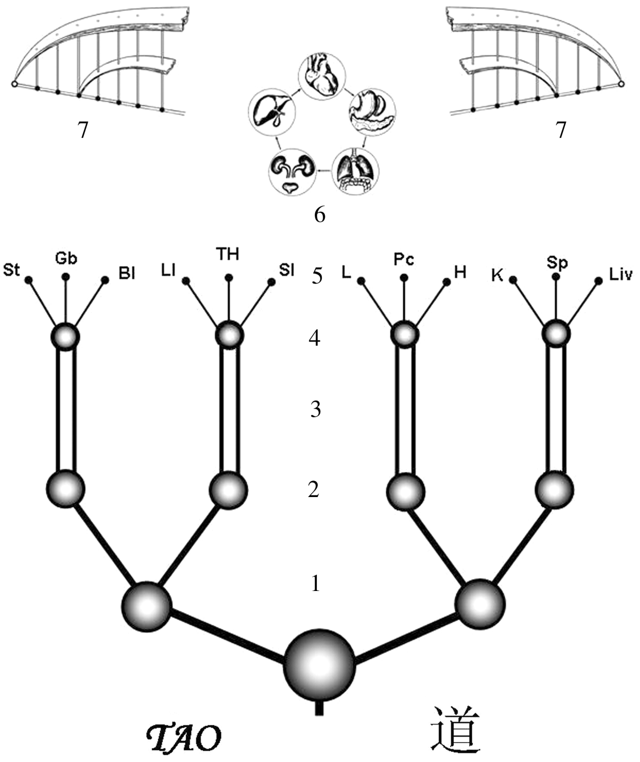

FIG. 4. There are main blocks and levels of the human body: (1) Yin and Yang; (2) Four Seas; (3) Eight Extra Channels; (4) Group Luo points: (5) 12 Organs and Channels; (6) Solid and Hollow Organs; (7) Channels and Collaterals.

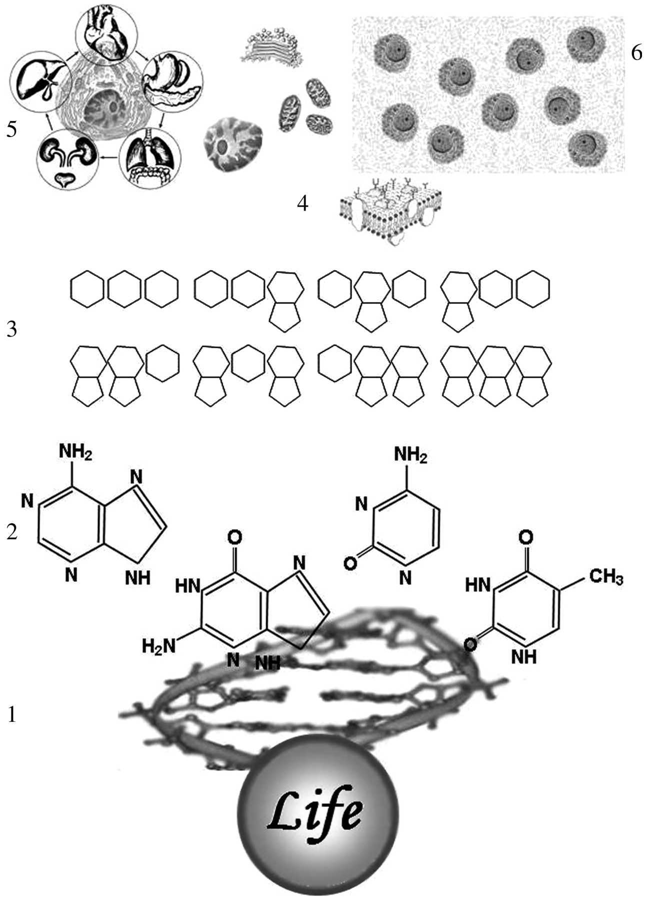

FIG. 5. There is molecular and cellular scheme of the human body: (1) A double helix of DNA molecules; (2) 4 nucleotides; (3) 8 types of Triplets; (4) cell membranes; (5) subcellular structures; (6) cells and intercellular space.

Analyzing theories used in TCM, we believe that they can be easily represented as a simple mathematical model, showing the general laws of the relationship between physiological and pathological process in the human organism.[1,2]

Therefore, instead of an incalculable quantity of cells—and no easily studied mechanisms of interaction between them—ancient Chinese physicians designed a relatively simplified model of the human body. This model consisted of the limited number of Elements (acupoints, channels, organs, seas), which can have *Excess* or *Deficiency* conditions (Figure 4).

The analogous scheme of the living body based on molecular and cellular structures is presented in Figure 5. If we compare both schemes in Figures 4 and 5, we find that 1 system is similar to another.

DISCUSSION

We have herein raised many, but not all, of the complex issues regarding TCM; we have attempted to offer questions and suggest matters that may perhaps be outside the norm for modern scientific thinking. Some ideas may appear dubious and may not persuade the skeptic mind. Nevertheless, we believe that as a whole, the majority of terms and theories of TCM can be explained in modern suppositions. Thus, we can study and understand TCM, and ancient knowledge can be useful for both scientific study and daily practice.

CONCLUSIONS

Our hope is that TCM may become vital and acceptable in the Western world, and that Western physicians may recognize modern scientific ideas perhaps in ancient theories. We trust that differences in the terms applied for descriptions of similar ideas in both modern medicine and TCM will not prevent integration of TCM in the modern health care system.

DISCLOSURE STATEMENT

No competing financial interests exist.

PREVIOUS PRESENTATION

The main ideas of this article were presented during the American Academy of Medical Acupuncture (AAMA) 20th Annual Symposium, April 2008, in Washington, DC. They are also included in the manual *Classic and Modern Aspects of Traditional Chinese Medicine*, prepared by Mikhail Teppone, MD, and provided during training courses on acupuncture. Some ideas from this article were presented at a Congress in Russia in 2004.[1]

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Address correspondence to:
Mikhail Teppone, MD, DAc
AcuTech International Inc
1057 Steeles Avenue West
PO Box 81538
Toronto, ON, M2R 3X1
Canada

E-mail: mikhail.teppone@gmail.com

2008 International Conference on Integrative Medicine
EBNMP Canada & USA
Hilton Garden Inn
October 19, 2008
9:00 am – 7:30 pm
Vaughan, ON

ANTEL is a Modern Diagnostic Tool for Every Day Practice & Scientific Study in TCM Field

M.Teppone, Acutech International Inc.

2008 International Conference on Integrative Medicine. – EBNMP Canada & USA, Hilton Garden Inn,
Vaughan, ON, October 19, 2008.

In accordance with the **theory of traditional Chinese medicine** (TCM) any condition of the body can be described by means of Qi. In modern terms it can be correlated to the body metabolic activity. In 1950-51, *Yoshio Nakatani* found a line similar to the Kidney Meridian that had a series of points in which electro-conductivity was higher than the surrounding area. He also found that Yuan (source) points were the most informative to define condition of the whole meridian. Finally *Yoshio Nakatani* developed a new diagnostic and therapeutic method known as Ryodoraku ("*line of good conductivity*").

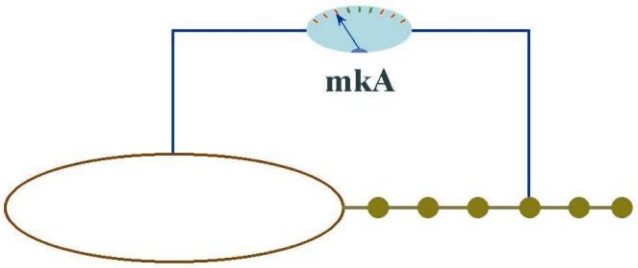


Figure 1. The principle scheme of "Ryodoraku" method

The ANTEL hardware incorporates the recent achievements of electronics (fig 2). Therefore, it allows getting precise and reproducible results from measurements of channel's conductivity. Prior to the diagnostic test the device is calibrated in order to make results of various measurements comparable.

Figure 2. Diagnostic complex ANTEL

The software automatically shows points, which are systematically measured. Measurement results are recorded into a *RyoTable*. The software then calculates an individual norm corridor. All Channels with a higher measurement than the norm corridor are in Excess condition. All Channels with a lower measurement than the norm corridor are in Deficiency condition (fig 3).

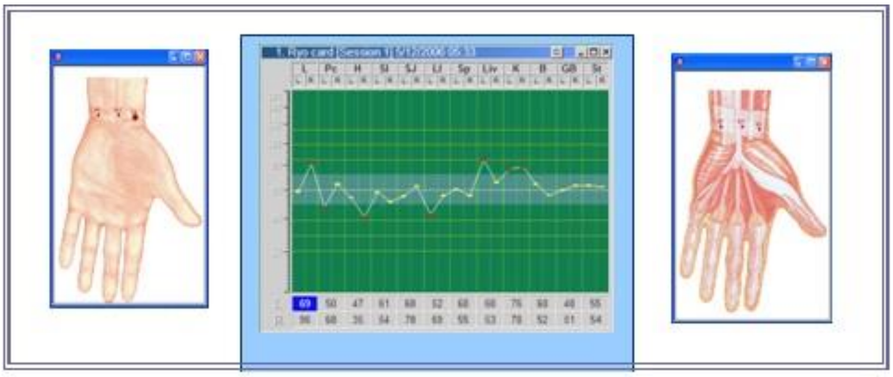


Figure 3. ANTEL software screen: *RyoTable* and picture of the measured acupoints

ANTEL software analyzes results of measuring and provides special calculations based on principles and laws of TCM, namely “*12 Channels*”, “*5 elements*”, “*Yang & Yin*” pairs, “*Left - Right*” branches, “*Hand - Foot Channels*”, etc. Results of calculations can be presented as digital data and diagrams (fig. 4).

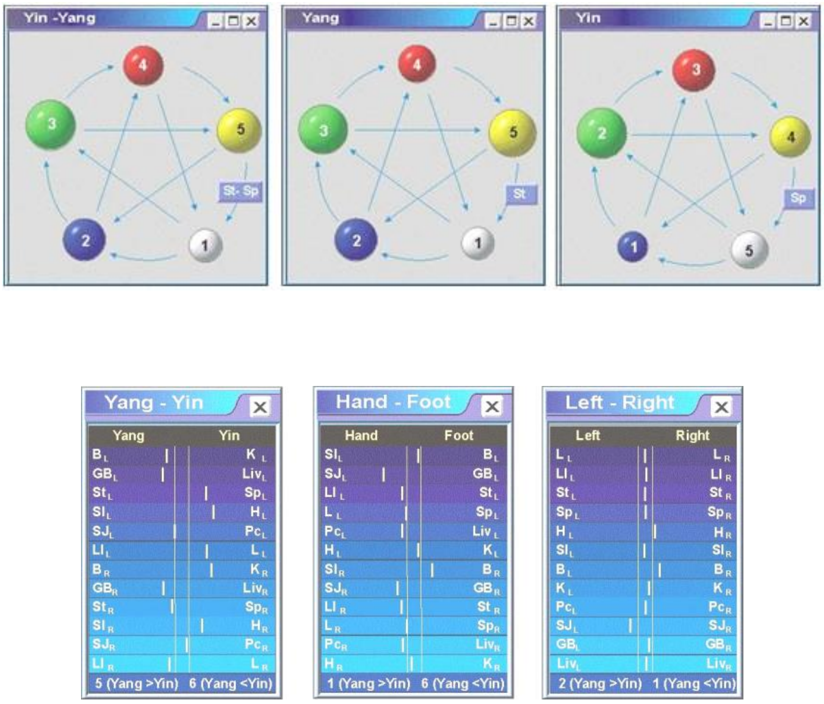

Yin -Yang
4
3
5
St- Sp
2
1
Yang
4
3
5
St
2
1
Yin
3
2
4
Sp
1
5
Yang - Yin
Yang
Yin
B L | K L
GB L | Liv L
St L | Sp L
SI L | H L
SJ L | Pc L
LI L | L L
B R | K R
GB R | Liv R
St R | Sp R
SI R | H R
SJ R | Pc R
LI R | L R
5 (Yang >Yin) 6 (Yang <Yin)
Hand - Foot
Hand
Foot
SI L | B L
SJ L | GB L
LI L | St L
L L | Sp L
Pc L | Liv L
H L | K L
SI R | B R
SJ R | GB R
LI R | St R
L R | Sp R
Pc R | Liv R
H R | K R
1 (Yang >Yin) 6 (Yang <Yin)
Left - Right
Left
Right
L L | L R
LI L | LI R
St L | St R
Sp L | Sp R
H L | H R
SI L | SI R
B L | B R
K L | K R
Pc L | Pc R
SJ L | SJ R
GB L | GB R
Liv L | Liv R
2 (Yang >Yin) 1 (Yang <Yin)

Figure 4. Analyzes on the base of the *Five Elements*, *Yang−Yin*, *Hand−Foot* and *Left−Right* laws.

After calculation the software recommends necessary acupoints and skin zones as well as technique of needling manipulation. Treatment includes the following options:

- General treatment: Spleen - Stomach balancing, reinforcing Heat or Kidneys,
- Restoration of balance between Yin and Yang systems,
- Restoration of balance between Yin−Yang pairs,
- Restoration of balance between groups of 3 channels (triads) via centre of the body,
- Restoration of balance between 5 elements,
- Simple reinforcement or sedation of channels that have Excess or Deficiency.

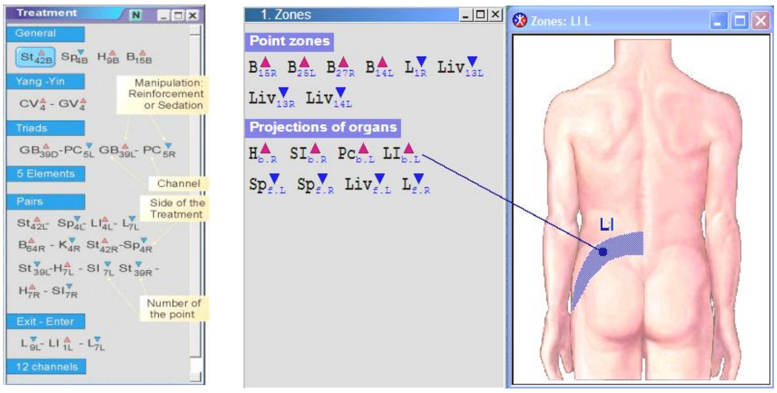
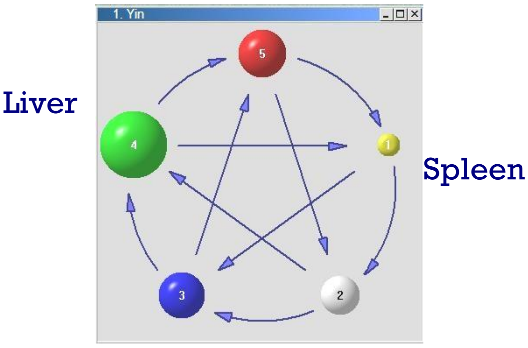
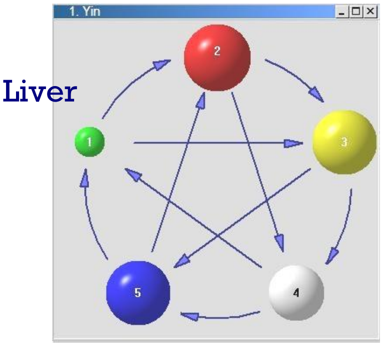

Treatment
N
General
St_{42B}▲ Sp_{4B}▼ H_{9B}▲ B_{15B}▲
Yang -Yin
CV_{4}▲ - GV_{4}▲
Manipulation: Reinforcement or Sedation
Triads
GB_{39D}▲-PC_{5L}▼ GB_{39L}▲- PC_{5R}▼
5 Elements
Channel
Pairs
Side of the Treatment
St_{42L}▲- Sp_{4L}▼- LI_{4L}▲- L_{7L}▼
B_{64R}▲ - K_{4R}▼ St_{42R}▲-Sp_{4R}▼
St_{39L}▼-H_{7L}▲ - SI_{7L}▼ St_{39R}▼ -
H_{7R}▲ - SI_{7R}▼
Number of the point
Exit - Enter
L_{9L}▼- LI_{1L}▲ - L_{7L}▼
12 channels
1. Zones
Point zones
B_{15R}▲ B_{25L}▲ B_{27R}▲ B_{14L}▲ L_{1R}▼ Liv_{13L}▼
Liv_{13R}▼ Liv_{14L}▼
Projections of organs
$H_{b.R}$▲ $SI_{b.R}$▲ $Pc_{b.L}$▲ $LI_{b.L}$▲
$Sp_{f.L}$▼ $Sp_{f.R}$▼ $Liv_{f.L}$▼ $L_{f.R}$▼
Zones: LI L
LI

Figure 5. Recommendations for treatment given by "ANTEL" software

There are examples of clinical studies and practical application of ANTEL software:

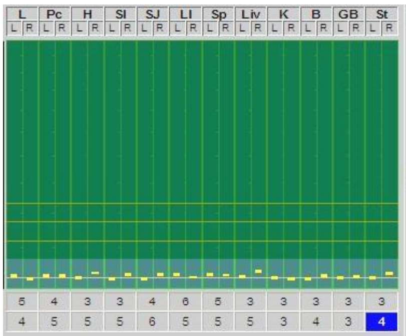
a) Differentiation a type of stroke: *Hemorrhagic stroke* was characterized by Excess of *Liver* and Deficiency of *Spleen*, but *Ischemic stroke* was characterized by Deficiency of *Liver* channel mainly.


1. Yin
Liver
Spleen
5
4
1
3
2

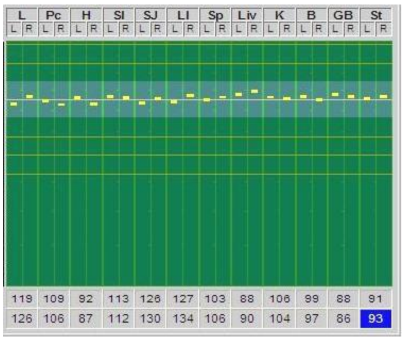

1. Yin
Liver
2
1
3
5
4

b) *Coma condition* had signs of "absolute norm" and all channels had the same results of measurement and there was no deviation from the middle line. 2-3 days before death patient had very low readings (a), but several hours before death all readings increased (b).

(a)


L
Pc
H
SI
SJ
LI
Sp
Liv
K
B
GB
St
L R

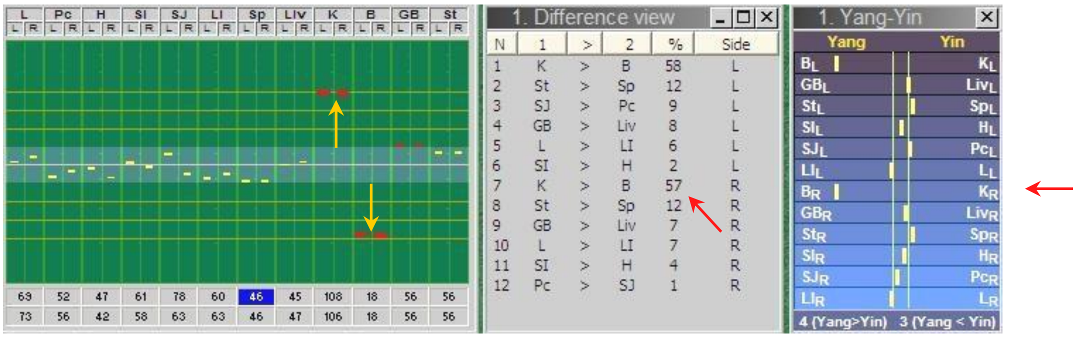
5	4	3	3	4	6	5	3	3	3	3	3
4	5	5	5	6	5	5	5	3	4	3	4


L
Pc
H
SI
SJ
LI
Sp
Liv
K
B
GB
St
L R

119	109	92	113	126	127	103	88	106	99	88	91
126	106	87	112	130	134	106	90	104	97	86	93

(b)

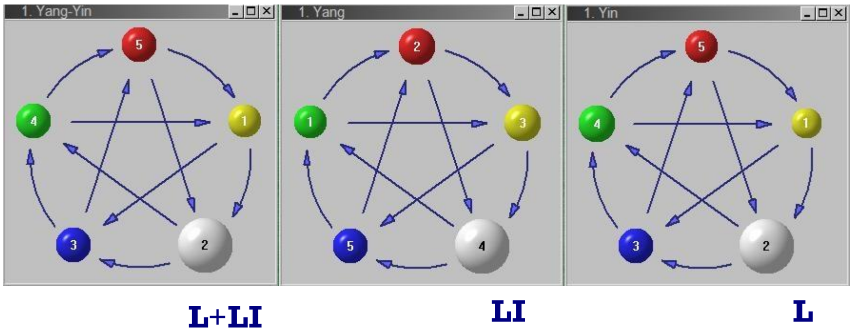
c) *Malignant* or *benign tumor* was accompanied by imbalance between Yin Channel (Excess) and Yang Channel (Deficiency). There is a typical result for the patient suffering from enlargement of prostate gland: the more difference between Kidneys (Excess) and Bladder (Deficiency) the more chance to have malignant tumor. We can imagine, that in case of any proliferate activity "*tissue from the solid* (Zang) *organ is transferred to the hollow* (Fu) *organ*".


1. Difference view
1. Yang-Yin
Yang
Yin
BL
KL
GBL
LivL
StL
SpL
SIL
HL
SJL
PcL
LIL
LL
BR
KR
GBR
LivR
StR
SpR
SIR
HR
SJR
PcR
LIR
LR
4 (Yang>Yin) 3 (Yang < Yin)

L	Pc	H	SI	SJ	LI	Sp	Liv	K	B	GB	St
63	52	47	61	78	60	46	45	108	18	56	56
73	56	42	58	63	63	46	47	106	18	56	56

N	1	>	2	%	Side
1	K	>	B	58	L
2	St	>	Sp	12	L
3	SJ	>	Pc	9	L
4	GB	>	Liv	8	L
5	L	>	LI	6	L
6	SI	>	H	2	L
7	K	>	B	57	R
8	St	>	Sp	12	R
9	GB	>	Liv	7	R
10	L	>	LI	7	R
11	SI	>	H	4	R
12	Pc	>	SJ	1	R

d) *Sjogren's syndrome* had significant Excess of Metal element (Lung & Large Intestine).


1. Yang-Yin
5
1
2
3
4
1. Yang
2
3
4
5
1
1. Yin
5
1
2
3
4

L+LI **LI** **L**

e) *Underdeveloped hand* was characterized by Deficiency of one site branches of Yang Hand channels.

f) Definition of channels' disorders caused by chemotherapy or X-ray therapy that helps to prevent or decrease side effects of radical therapy, etc.

Due to high accuracy of the channels' conductivity measurement and calculations provided by the ANTEL it is effective in both everyday practice and scientific study as well as for education and exams in TCM field.

20th Annual AAMA Symposium
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Twentieth Anniversary Symposium of
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April 10-13, 2008
Marriott Wardman Park
Washington, DC

Modern Interpretation of TCM Theory

Mikhail Teppone, Romen Avakyan

20th Annual Symposium for Medical Acupuncture. April 11-13, 2008, Washington, DC, USA
Handbook of Faculty Syllabus Materials, AAMA, 2008, p. 350-352 (poster).
https://archive.org/details/modern-interpretation-of-tcm

Introduction: Despite of the growing interest in Traditional Chinese Medicine (TCM) it has not yet been integrated into the mainstream healthcare system. The main obstacle for this integration is the difference of views on the nature of human organism, methods of diagnostics and treatment, as well as vague terms used in TCM.

Do we need to preserve the original TCM lingo or it is possible to match the TCM terms with their equivalents in modern medicine? Can a Western doctor apply such terms as Yin and Yang, Five Elements, Excess/Deficiency, Heat, or Wind in his daily acupuncture practice?

Analyzing the terms used in TCM we realize that they first appeared in the ancient oriental philosophy and had very broad meanings. In addition, we think that theory of TCM can be represented as a simple mathematical model, which shows general laws of relationship between physiological and pathological process in human organism.

Acupoints, Channels and Organs: The main aspects of Acupoints, Channels and Organs have been already described in the article “Modern View on the Theory of Channels, Collaterals and Organs”.[1] We repeat our idea shortly again: it is suggested that through the theory of “Channels and Collaterals,” ancients Chinese doctors described physiology and pathology of intercellular spaces as well as body cavities and by the theory of “Zang and Fu Organs,” they described cellular physiology and pathology. System of Acupoints is a part of the channels, in other words it is a part of intercellular spaces. Due to morphologic and functional complexity of acupoint’s area it provides interaction between internal body environments with its external surrounding.

Qi, Excess or Deficiency, Heat and Cold: We assume that ancient Chinese doctors understood the complexity of the human being and limitation of our three-dimension space. Ignoring theories about multidimensional world we can only analyze dependence of one parameter on one or two {$Y = f(x, z)$} simultaneously. Therefore, Chinese doctors proposed an idea, similar to cybernetic model, by which the complex system can have common managing or controlling parameter.[2] They suggested relative and universal measuring unit and gave it a name “Qi”. By means of Qi one may compare “non-comparable” signs and phenomenon, for example, height, weight, color, and time, condition of the health or disease and various therapeutic methods. This type of comparison is not made in quantitative but rather in qualitative characteristics, such as “more”, “much more”, “less”, “much less” or “equal”.

By evaluation of Qi a doctor can recognize any diseases and describe therapeutic recommendations. If patient has cough or dyspnoea, so it means that, there is a Lung disorder. If the cough is aggravated by inspiration then it means that there is an Excess condition of Lung. If cough is aggravated by expiration then it means that there is a Deficiency condition of the Lung. In case of Excess, one should sedate points of the Lung channel and in case of Deficiency, one should reinforce points of the same channel. Neither Western diagnosis of the patient nor results of laboratory analyses and x-ray examination should be taken into account for treatment by TCM methods.

Hence, Qi is a parameter “X” in the equation {Y = f (x, z)}. As far as “Z” is concerned, we can recognize it as an intensity of heat production i.e. the basis of “Heat” or “Cold” disease symptoms. In other words, “Z” describes predominance of exothermic or endothermic chemical reactions in the human body. Therefore, if exothermic reactions prevail then disease has Heat symptoms and requires “cleaning the heat”. On the contrary, if endothermic chemical reactions predominate, then disease has “Cold” symptoms and requires warming therapy. So, in TCM diagnosis it is necessary and enough to determine “Excess or Deficiency” for disease of channels {Y=f (x)} and both “Excess or Deficiency” and “Heat or Cold” for disease of organs {Y = f (x, z)}.

TAO, Yin & Yang, 5 elements: “Who knows (TAO), he does not speak (about it), who speaks, he does not know”. Nevertheless, who wants to imagine mathematic model of TAO should try to divide “1” by “0” [1/0]. We also recognize the following ideas in TAO:

- One truth: there is only one true way and there is no any choice; illusion of choice means lack of understanding or knowledge as well as breach of the law.
- Preexistence: everything is in existence from the very beginning; there is no evolution, but there realization of the preexisted pattern.
- Holistic approach: DAO creates interconnected parts Yin and Yang; “separation Yin from Yang results in death”, so if we study a part and omit at least one connection with the whole, it is not a part of the initial “whole” any longer, but it is already a new smaller whole.

“Yin and Yang” is a binary system of calculation and comparison. It can describe all variety of the world as well as simplify the extremely complex problem down to the choice of yes or no. Interactions between “Yin” and “Yang” are not completely antagonistic as [–1] and [+1], but there are phase transformations that are realized in the law of “5 elements”. From the mathematic model point of view, “5” is the least number of elements in the dynamic system with both direct and indirect either reinforcing or sedating interactions. This system can have six, seven or more elements, but not less than five.

Etiology of Disease. In both modern western medicine and TCM etiologic factors can be divided into three main groups: genetic disorders, emotional stress and environment or external factors. Nevertheless, description of external factors in TCM arises many questions, like “What does Wind mean?” etc.

We assume that based on their huge practical experience, doctors of ancient China have analyzed all symptoms, observed while helio-cosmic factors had action on the human body, and systematized them into 5 (6) types of reaction. They drew parallels between changes of the weather and symptoms of patients and developed special terms to describe those interactions: Heat, Cold, Wind, Dampness and Dryness. By means of terms “Heat” and “Cold” they described heat production of the patient’s body; by means “Dampness” and “Dryness” they described water metabolism and capacity of the body to accumulate water molecules; and by means of term “Wind” they estimated speed of changes of various parameters taking place in the patient’s body.

Pathogenesis of acute diseases. About 1800 years ago, Chinese doctor Zhang Zhongjing described the main symptoms and phases of acute disease evolution in his “Treatise on Febrile Diseases Caused by Cold” (Shanghan Lun); and also wrote prescription for therapy.[3] In the beginning of the last century, H.Selye again paid attention on the general symptoms of acute diseases and published results of his study in the article “A Syndrome Produced by Diverse Nocuous Agents”.[4]

According to the both theories, any acute disease starts from activation of body resistance. Dr. Zhang Zhongjing described this phase by means of disorders of Yang Channels. H. Selye and other modern scientists revealed that acute phase is characterized by activation of sympathetic autonomic nervous system, increase of corticosteroids production and intensive consumption of carbohydrates.

At the late stage, symptoms of exhaustion can be observed. Dr. Zhang Zhongjing described this phase by means of disorders of Yin pairs of Channels. In modern studies, this exhaustion phase of acute disease is characterized by decrease of parasympathetic autonomic nervous system activity as well as insulin production and transformation of metabolism from carbohydrates to lipids.

Thus, both Drs Zhang Zhongjing and Hans Selye described the same idea of acute diseases evolution, but they presented their theories in different words.

Mechanisms, which underlay the base of therapeutic effects of acupuncture. Modern studies have formed a base of scientific understanding, of the biological and therapeutic effects of acupuncture, moxibustion, acupressure, laser- or electro-puncture.

Usually anti-inflammatory, anti-swelling, anti-allergic, pain-relief and other effects are claimed. They considered that by acupuncture one might stimulate or modulate components of the immune and endocrine system, normalizing micro-circulation and metabolism. Recently, a lot of attention has been paid to neuropeptides, including endorphins and encephalin.

Analysis of various modern studies concludes that in any case only the normalizing effects accompany any successful treatment.

Therefore, if the patient initially has increased parameters then we wait for their decrease, and if the patient initially has, decreased parameters we hope to achieve their increase. Usually treatment does not change parameters, which were at a relative norm.

The more the initial change, the more improvement after treatment may be obtained. If the patient has a small initial change of some parameters then improvement after treatment may not be statistically proved.

Conclusion: Our desire in this article is that TCM will become vital and acceptable in Western world. We hope that difference in the terms applied for description of the same ideas will not prevent TCM from its integration in the modern health care system.

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4. Selye S. A Syndrome produced by Diverse Nocuous Agents. – Nature, 1936, Jul 4, V 138, p. 32.

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Study of the Parameters Influencing Brightness of Luminescence of Minimal Resistance Points

M.Teppone, R.Avakyan, A.Markov
Acutech International Inc (Canada) and Coloyaro-2000 Ltd (Russia)
Graviton Ltd (Russia)

20th Annual Symposium for Medical Acupuncture. - April 11-13, 2008, Washington, DC, USA
Handbook of Faculty Syllabus Materials, AAMA, 2008, p. 000-000 (poster).
https://archive.org/details/study-parameters-luminescence

Introduction:

Animal and human skin is known to have points with low electrical resistance.[1-4] Analogous points have been found on plants and insects.[5-6] Human skin retains electrical heterogeneity that may be detected several days after death. Due to autolytic processes in cells after death, the physical parameters of the skin are gradually equalizing and electrical heterogeneity is gradually disappearing.[3-4]

In terms of Traditional Chinese Medicine these low resistance points are described as Acupoints where Qi penetrates the skin. Modern study revealed that sites of Acupoints had complex structure beneath the skin with weak connections between the cells allowing for the interaction of the body and the environment (fig. 1).[7-9]

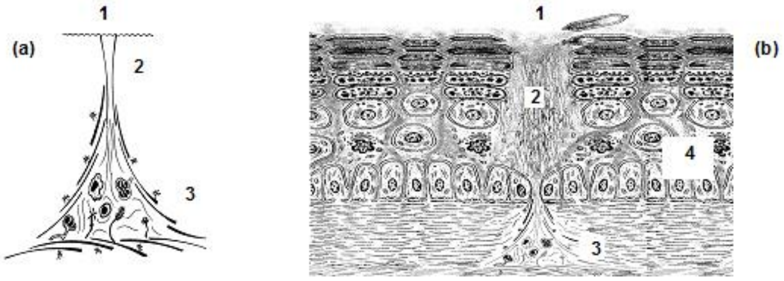

Figure 1. Chart of the acupoint (a) and skin (b):
1) Skin surface: «exit – entrance» of acupoint,
2) Channel of acupoint,
3) Various elements of «active part» of acupoint,
4) Cells and intercellular spaces of the skin.

In terms of electrical characteristics, a human skin may be described as a multi-layered dielectric alternating with conductive layers of which a keratinized epithelium of the surface has the most resistance. The connection between epithelium cells is weaker in acupoints, thus providing for the channel connecting skin surface with the active zone of the point. The conductivity of the "point channel" and the conductivity between the points alongside the same Regular channel depend on the energy level: the higher the energy level, the higher the conductivity and vice versa.[1-2]

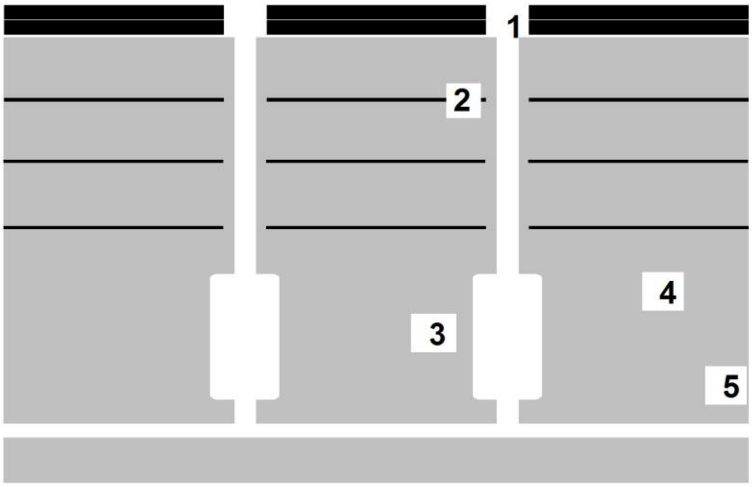

Figure. 2. Chart of electrical properties of the skin:
1) Skin surface, a «gateway» of the point channel
2) Channel of the point
3) Active zone of the point
4) Skin cell elements and intercellular space
5) Main channels connecting active zones of the points

2. *Physical Significance and the Order of Visualization of the Least Resistant Points*

AcuVision device was developed in the early 90th in order to visualize the points of the least resistance in a high voltage field of corona discharge.

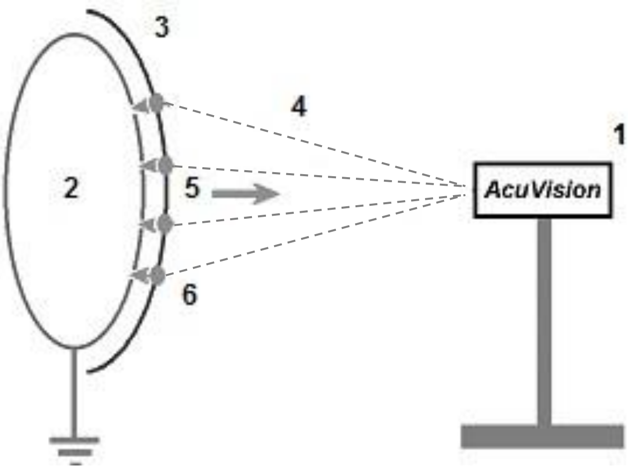

Figure 3. Physical principle of visualization of local skin conductivity:
1) Active (positive) electrode of “AcuVision” device
2) Grounded bio-object or patient
3) Dielectric (polyethylene or cotton tissue),
4) Lines of forces of corona discharge,
5) Direction of negatively charged ions and electrons,
6) Luminosity on dielectric in the points of increased conductivity

"AcuVision" aided examination is carried out as follows:

A patient or another bio-object or a model are grounded by a special electrode (a "zero" electrode). Once the device is turned on a high voltage corona discharge is generated between the active electrode and the grounded bio-object, with lines of forces directed to the points of the least electrical resistance on the object's surface. If the surface of the examined subject is covered by dielectric (such as polyethylene film or a paper towel), it causes "breaks through" dielectric generating weak bluish stimulated luminescence (see figures 3 and 4).

Application of AcuVision device demonstrated the presence of low resistance points on the surface of any live subject [1993−1994]. It was also demonstrated that in case of channel deficiency (e.g. in the patients with paralysis due to spinal trauma) no acupoints could be visualized on the patient's legs by AcuVision [1995-1996]. The study by a group of masters demonstrated that Qi Gong practitioners could change conductivity of hand and auricular acupoints [2000].

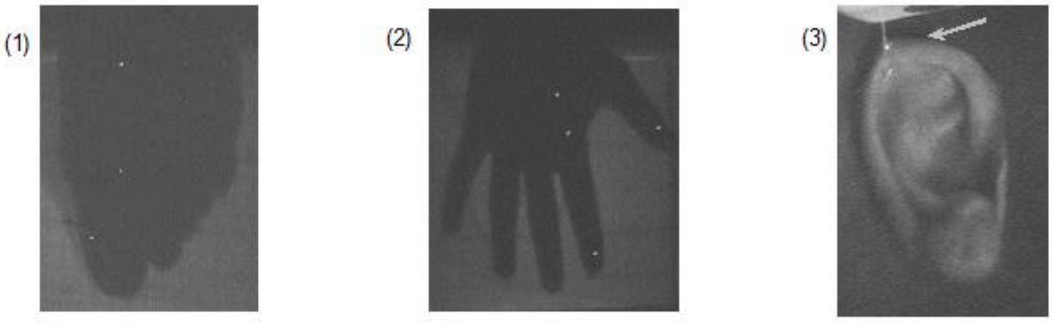

Figure. 4 Examples of low resistance point visualization:
1) Acupoints on the right foot,
2) Acupoints on the back surface of the left hand,
3) Auricular point of the corpse (1 day after death).

Materials and Methods

In 2007 we have conducted experiments to study the parameters influencing the degree of luminescence.

In our study "AcuVision" device[10] manufactured by Coloyaro-2000 Ltd and Graviton Ltd was applied. It was a microprocessor controlled high-voltage pulse generator. Maximum voltage between active and "zero" (ground) electrode was 24000 V; max electrical current between electrodes was 100 mkA. We applied positive active electrode to achieve the movement of negative air-ions and electrons from the experimental body surface toward the active electrode (fig. 3).

The experiment was conducted on a model simulating skin with high resistance with focal points of high conductivity. A 5 mm thick dielectric plate [Plexiglas: resistance ~ $5 \cdot 10^{12}$ Ohm) with 1 mm holes was used as a model. Copper electrodes of a uniform diameter (of the electrode body) were inserted into the holes. One of the flanks of 2 electrodes was fitted with different diameter extensions, like a head of a nail.

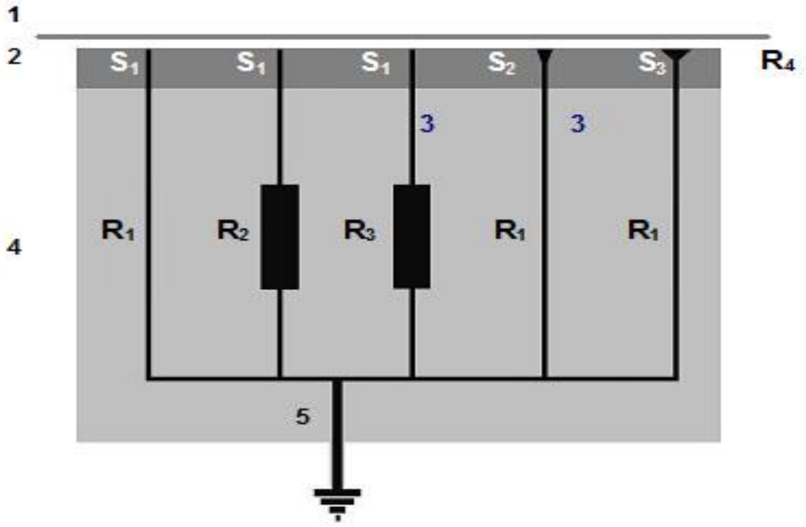

Figure. 5 Electrical model for skin simulation used in the experiment
1) Thin dielectric on the skin model surface,
2) Thick dielectric (Plexiglas) imitating skin (R_4),
3) Electrodes with different surface areas (S),
4) Resistors of different resistance ($R_1 - R_3$).
5) Grounding electrode.

The surface or the dielectric plate with electrodes inserted (heads up) was covered by a dielectric [polyethylene film; permittivity (ε) ~ 2.3]. Opposite ends of the electrodes were connected to the zero (grounding) electrode of AcuVision device.

The distance between the positive electrode of AcuVision device and the surface of dielectric was constant (20 mm).

Current passing through the electrode was measured and displayed on the front panel of the device. The device scale of 100 mkA range is divided into 10, with each point equaling approximately 10 ± 3 mkA.

Due to weakness of luminescence, the test was conducted in a dark room. A slight red light that did not interfere with the perception of a blue luminescence could be used additionally. The voltage between the active and the zero (“ground” electrodes was regulated with “Level” handle on the front panel of the device, as well as by adding consecutive resistor between the zero electrode and the electrode inside the dielectric simulating the skin. A digital camera recorded luminescence on the dielectric.

The First Part of the Experiment:

A spot with a stimulated bluish luminescence appeared on the dielectric covering the skin simulating material once the device was turned on. In the beginning of the experiment “Level” handle was in the extreme right position (set on voltage of 24000 V).

After that the “Level” handle was turned left to reduce the electric current on the zero electrode and the electrode inserted in the skin simulating material and the luminosity decreased accordingly. Thus the current 80 mkA corresponds to the luminosity on photograph # 1 (photos will be demonstrated during presentation); current 60 corresponds to the luminosity on photograph # 2; current 40 corresponds to the luminosity on photograph # 3.

Second Part of the Experiment:

The “Level” handle was in the extreme right position (set on voltage of 24000 V).

Consecutive resistors reducing the electric current on the electrodes were added between a zero electrode and the electrode inside the dielectric simulating the skin. Additional resistors reduced the electric current, and thus reduced the intensity of luminescence.

1) Without resistor: the current was 80 mkA that corresponds to the luminosity on photo # 4.

2) Resistor 30 Mega-ohms: current was 70 mkA that corresponds to the luminosity on photo # 5.

3) Resistor 60 Mega-ohms: current 60 corresponds to the luminosity on photo # 6.

Third Part of the Experiment:

Electrodes with flanks fitted with an extension, like a head of a nail were used to evaluate the relationship between the intensity of luminescence and the surface of the conductive surface. The electrodes used had the following diameters of conductive surfaces: 1 (S_1); 3 (S_2) и 5 (S_3) mm. The ends of the conductors were connected with the grounding electrode on the inside. The “Level” handle was in the extreme right position (voltage of 24000 V).

The relationship between the electric current passing through the electrodes and different electrode surfaces was studied at the first stage of the experiment. It was found that the current did not depend on the dimensions of the conductive surface and was the same as in the first experiment.

The second stage of the experiment evaluated the relationship of intensity of luminescence and the size of conductive surface of an electrode, while the material simulating skin was covered with a thin dielectric (polyethylene film). It was found that a point luminescence on the dielectric was approximately of the same intensity notwithstanding the electrode surfaces: diameter of the conductive surface of 1 mm (photo # 7); for the diameter of the conductive surface of 3 mm (photo # 8), for the diameter of the conductive surface of 5 mm (photo # 9),

Conclusions:

The conclusions based on the above experiments:

1) AcuVision device visualized the points of the least resistance on the surface of dielectric;

2). Brightness and dimensions of the luminescent spots depend on the current passing through the areas of increased conductivity;

3) The brightness and the dimension of the luminescent spots do not depend on the size of the conductive spot.

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Modern View on the Theory of Channels, Collaterals, and Organs

Mikhail Teppone, MD and Romen Avakyan, PhD

ABSTRACT

The theory of Channels, Collaterals, and Organs is one of the most important but at the same time, one of the most difficult in Traditional Chinese Medicine (TCM). Do we need to preserve the original TCM lingo or is it possible to match the TCM terms with their equivalents in modern medicine? The authors review the main ideas about Channels and Organs theory and provide their own explanation.

We believe that ancient Chinese doctors understood the complexity of the human body and divided it into 2 morpho-funcional parts: cells and intercellular spaces. Through the theory of "Channels and Collaterals," those physicians described physiology and pathology of intercellular spaces and by the theory of "Zang and Fu Organs," they described cellular physiology and pathology.

Key Words: Channels, Collaterals, Meridians, Organs, Cells, Intercellular Space

INTRODUCTION

In the developed Western countries, people are increasingly aware of different types of alternative medicine. Despite the growing interest, alternative medicine has not yet been integrated into the mainstream healthcare system. Therefore, still remaining are 2 separate forms of medical practice, Modern Western and Traditional Eastern or Chinese medicine.

No doubt perhaps, the future of medicine lies in the integration of modern technology and the extensive wisdom and experience of Eastern healing methodology. The main obstacle for such integration is the difference of views on the nature of human organism, methods of diagnosing and treatment, as well as vague terms used in Traditional Chinese Medicine (TCM).

Do we need to preserve the original TCM lingo or is it possible to match the TCM terms with their equivalents in modern medicine? Can we apply such terms as Yin and Yang, Five Elements, Excess/Deficiency, Heat, and Wind interchangeably with those of sympathetic and parasympathetic nervous systems, various hormones, endorphins? After reading, our hope is that vague and unknown words will take on a new, deeper meaning in relation to the universal laws of nature and human development. Our desire is that TCM will become vital and accepted in the modern Western world.

According to the TCM theory of energy, Qi circulates through the human body via special pathways known as *Channels* and *Collaterals.* This process supports normal organ and body functions. When disease occurs, the cause may be internal (hereditary or congenital Qi disorders, strong emotions, etc) or external (Wind, Heat, Cold, etc). Pathological conditions in TCM can be attributed to abnormal circulation of Qi and blood, which results in a state of excess or deficiency of organs and channels. Therapeutic methods used in TCM restore balance of Qi and blood between various points in the body.

MATHEMATICAL MODEL OF THE HUMAN BODY

The terms used in TCM first appeared in the ancient oriental philosophy and have very broad meanings. Modern science, on the contrary, employs terms with precise and exact definitions. Therefore, any attempt at literal translation of TCM terms into modern language directly would result in a loss of meaning and essence of that particular term.

TCM theory can be represented as a simple mathemati-

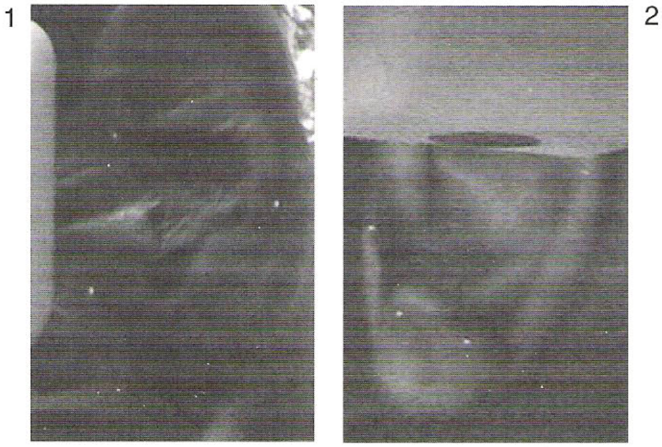

FIG. 1. White spots on the ears as a result of stimulated luminescence on the dielectric medium above low electrical resistance points. There is a left ear of the living man (**1**) and there is a left ear of the corpse: one day after death (**2**).

cal model which would show the relationship between physiological and pathological laws of human organism. When we apply this model, where TCM terms and principles resemble elements of algebraic equation, we can understand an individual patient problem and find specific treatment approach. This is also true in cases of unknown etiology and pathogenesis where diagnosis and treatment are yet to be developed.

ACUPOINTS

The skin of both human and animal is characterized by morphological and functional heterogeneity. The same is true for bodies of plants and insects.[1,2] In TCM, this heterogeneity is described as Acupoints, Skin Zones, Channels, and Collaterals.

Some publications on acupoints argue that there are no unusual morphological elements at the site of acupoints. Loose connective tissue with large numbers of nerve receptors, free nerve endings, extensive microcirculatory system, and cells with biologically active substances form the morphological basis for acupoints and intercellular connections, which include gap junctions. Gap junctions are microscopic water channels that directly supply exchange of broad spectrum of nutrients between cytoplasm of tissue cells.[3–7]

Skin resistance varies from one to two Mega-ohms, but at the site of acupoint entrance, it decreases to 20–60 Kilo-ohms.[8–11] Due to low resistance of skin at the site of acupoints, one may visualize them by a high voltage corona discharge device. Disruption of the electrical field has the highest value above low electric resistance points of the skin. At these areas, stimulated luminescence is observed on the dielectric medium (Figure 1).[12]

Besides electrical heterogeneity, acupoints have other specific characteristics such as low frequency oscillations (7–10 and 15–20 Hz),[13] spontaneous visible light emission,[14] increased accumulation of radioactive phosphorus,[15] increased sensitivity to high frequency electromagnetic radiation,[16,17] high conductivity or natural electromagnetic radiation from the sun,[18] etc.

This electrical heterogeneity of skin can still be detected during the first few days after death.[2,19–21] However, due to autolytic processes occurring in the cell post mortem, the physical parameters of skin gradually equalize and electrical heterogeneity disappears.

Taking into account the above information—as well as the Chinese term for acupoint, *kong xue*, which means fissure or crevice—we can conclude that acupoints are places in the skin where connections between the epithelial cells are not tight, thus providing an entrance into the body. The site of acupoints contains large numbers of active elements, which make it a complex functional unit that provides interaction between internal body environments with its external surrounding (Figure 2).

SYSTEM OF CHANNELS AND COLLATERALS

Qi and blood circulate in the human body along Channels and Collaterals. There are 12 main channels and their secondary vessels which supply normal function and defense of the human body by means of circulating Qi and blood. Secondary vessels include Tendino-Muscular Channels, Luo Channels or Collaterals, Divergent Channels, and Curious or Extra Channels (Figure 3). Currently, there are 2 different views on channels. First, the channels themselves are non–existent; an imaginary line called ⟨⟨meridian⟩⟩ connects

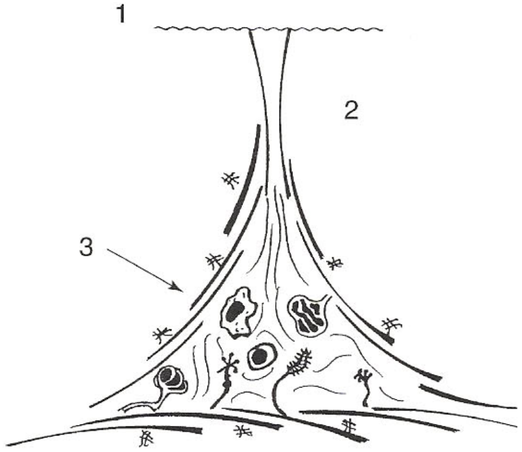

FIG. 2. There is a suggested scheme of acupoints: (**1**) Skin surface; (**2**) "Channel" of the acupoint; (**3**) Various elements of the "active zone" of the acupoint.

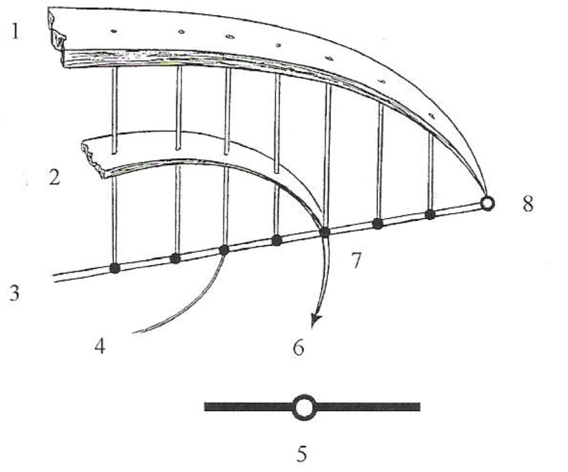

FIG. 3. Structure of Channels and Collaterals (*Jing & Luo*): (**1**) Tendino-Musclular Channel; (**2**) Luo-Channel or Collateral; (**3**) Regular or Main Channel; (**4**) Divergent Channel; (**5**) *Yuan* (Source) Point of the paired Channel; (**6**) Luo-Transversal Vessel; (**7**) *Luo* - Point; (**8**) *Ting* (Well) - Point.

functionally similar points; true connection between points is achieved through the function of the nervous and endocrine systems.[22,23]

Second, experimental data suggest the presence of a morphological relationship between the points of the same channel. For example, during acupuncture, the conduction along exact pathways of sensory reactions,[24] electrical current,[25,26] warmth,[27] visible light,[28] and radioactive isotopes[29] take place.

The modern science approach suggest the presence of correlation between structure and function of a biological object. Presently, no specific structure has been found to identify the channels. But, sometimes the absence of structures can make way for a new function. For example, the "door or window aperture," "river bed," or "gap" all provide conduction or passage.

The main function of the channels is to *conduct:* electrical current, warmth, light, etc so that Qi travels along the channel. Channels can best be described as a network of gaps stretching along the well known anatomical structures. The inner channel walls are formed by the surfaces of muscles, bones, tendons, vessels, and cells. These channels are filled with fibrous connective tissue, electrolytes, and structured water molecules.[30,31] We presume that to be sufficient to ensure Qi conduction.

This theory is supported by the research of Korean physician Kim Bon Chan[32] as well as the description found in the ancient book of the famous Chinese physician, Li Shi Zhen: "the inside of a human body contains tunnels and one, who mentally looks within self, can illuminate them."[33]

Experimental data reveal that informational interaction between cells is achieved through the electromagnetic field at the range of 1×10^{10} Hz.[28,34] From physics, we know that only wave-guides or dielectric wave-guides can conduct these high frequency waves. Impulses of relatively low frequency are conducted by the nervous system, but high frequency signals are conducted by the system of "gaps" or wave-guides. Thus, the channels are the only possible entities that can transmit high frequency impulses produced by cells. Theoretical and experimental data show that channels can act as weave-guides to conduct electromagnetic waves of various ranges.[1,28]

Possibly, channels and collaterals form the oldest independent regulatory system of humans and animals.[35–37] Morphological simplicity of channels is the reason why they have not been identified. In the words of a biologist, "channel system is too primitive in a view of modern biology."[38] Though basic, the channel system connects other more complex regulatory systems and provides interaction of inner organs with outside environment.

Based on the above, we can conclude that by using the theory of channels and collaterals, ancient Chinese doctors described physiology and pathology of intercellular spaces and body cavities (Figure 4).[39]

One may attempt to find correlation between channels, secondary vessels, and intercellular spaces of various anatomical structures, but this correlation would be more functional than anatomical. Depending on the disease and its sequence, disorders of organs and tissues can be linked to various channel structures. For example, in the event of inflammation of skin and subcutaneous tissue characterized by inflammatory symptoms such as localized redness, hyperthermia, hyperesthesia, edema, and pain exacerbated by pressure, this type of abnormality can be described as "Excess of the Tendino-Muscular" channel. If skin changes its integrity, as when a keloid scar or ulcer is present, this would point to a disorder of the *Luo* channel.

Governor Vessel is a typical example of the gap model of a channel. It originates in the kidney, extends down to

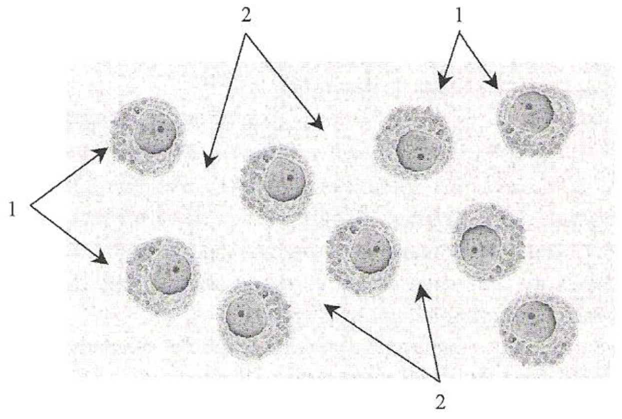

FIG. 4. Cells and intercellular spaces ("channels"). (**1**) Cells; (**2**) Intercellular Space.

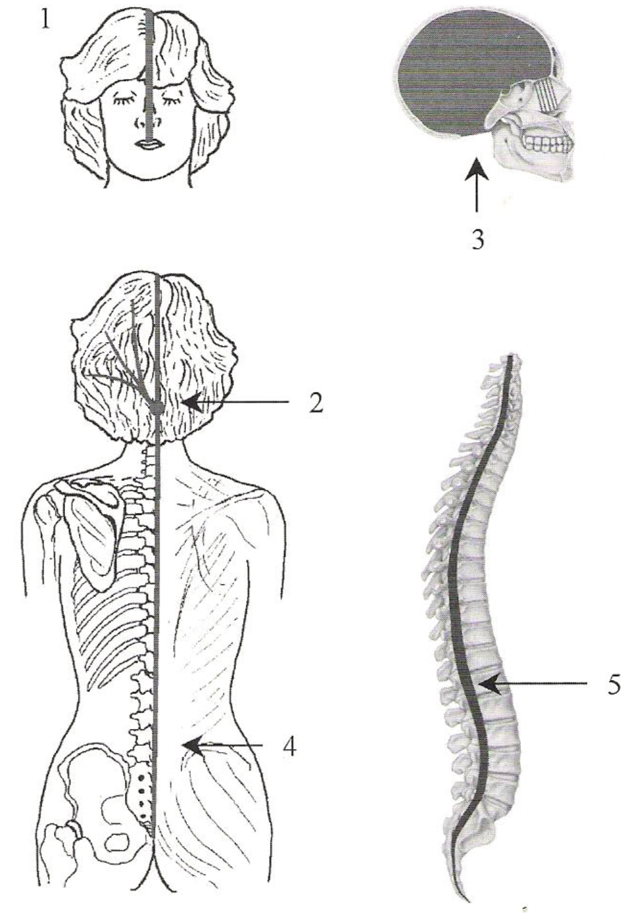

FIG. 5. There is a scheme of the Governor Vessel and a vertebral channel, which is an anatomical correlation of Governor Vessel. (**1**) The terminal pathway of Governor Vessel; (**2**) Internal branch of Governor Vessel begins at the point GV 16; (**3**) Point GV 16 (Fong Fu) corresponds to Foramen Magnum; (**4**) Governor Vessel; (**5**) Vertebral channel.

the perineum through the uterus or prostate gland, and then, one of the main branches ascends through the vertebral column. The point of GV 16 (Fong Fu) gives birth to the branch, which enters the skull. Its main pathway lies through the top of the head and ends at the upper lip.

What is an anatomical equivalent of the Governor Vessel: spinal chord or vertebral column? We believe that Governor Vessel is a vertebral channel; GV 16 (Fong Fu) corresponds to Foramen Magnum at the occipital bone. Therefore, the branch of Governor Vessel penetrating the skull is the extension of the vertebral channel into the skull through Foramen Magnum (Figure 5).

In much the same way, we can analyze Conception Vessel and describe its relationship to the chest, abdominal, and pelvic cavities. Therefore, both Governor and Conception Vessels are cavities themselves, regulating the function of their respective organs.

Hence, channels are not organs, tissues, or cells but various body cavities. This approach is not yet integrated in modern Western medicine.

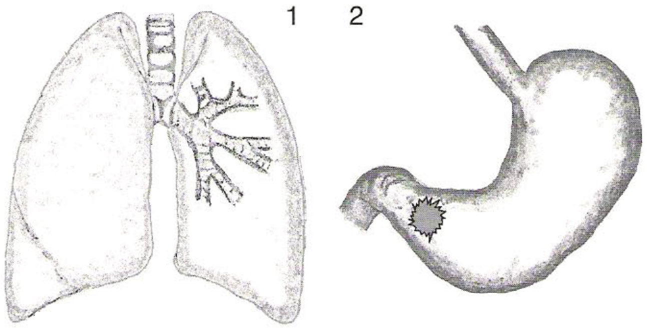

FIG. 6. Lung (Yin) with the Bronchus (Yang) inside (**1**) and Stomach (Yang) with a Stomach wall (Yin) outside (**2**). Peptic ulcer is localized at the Stomach wall, which belongs to the Spleen-Pancreas.

STRUCTURE AND FUNCTION OF ZANG (YIN) AND FU (YANG) ORGANS

TCM distinguishes 12 main organs in the human body: Lung, Spleen, Heart, Kidney, Liver, Pericardium, Stomach, Large Intestine, Small Intestine, Gallbladder, Bladder, and "Triple Energizer" (San Jiao). The first 6 belong to viscera or Zang (solid) organs; the other 6 belong to hollow or Fu (hollow) organs. These organs are divided into Yin-Yang related pairs, which form one of the Five Elements.

Zang or dense organs have inner cavities (bronchus, bile ducts, renal calyx, pelvis, etc and correspond to Fu or hollow organs (Figure 6). At the same time, Fu organs have solid walls, which correspond to the Zang organs (Figure 6).

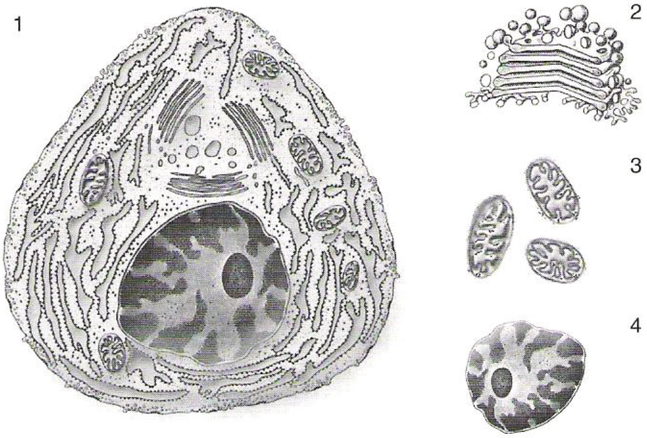

FIG. 7. Cells and organelles correspond to the Zang & Fu Organs (**1**): Golgi complex corresponds to the "Liver" (**2**), Mitochondria corresponds to the "Lungs" (**3**), nucleus corresponds to the "Kidneys" (**4**).

Thus, Zang organs contain Fu properties inside, and Fu organs contain Zang properties outside. Therefore, a renal calculus is actually located in the Bladder Channel and peptic ulcer will need treatment of the Spleen Channel.

The term *organ* in TCM involves much broader meaning than an anatomical formation. All cells contain standard components like nucleus, mitochondria, Golgi complex, endoplasmic reticulum, etc. Each organelle possesses certain inherent functions. Function of oxidative phosphorylation and synthesis of ATP molecules is carried out in mitochondria; synthesis and transport of proteins takes place in endoplasmic reticulum; Golgi complex is responsible for the accumulation of proteins, synthesis of polysaccharides, and more complex substances; the function of regulation of differentiation, development, and death of cells belongs to the nucleus (Figure 7).

In the majority of cells, it is possible to allocate the function of breathing, which corresponds to the lung; function of synthesis and storage of complex substance, which is appropriate for endocrine glands and the liver; and function of regulation of cell age, corresponding to the kidneys, etc.

Thus, the concept of organ in TCM includes the set of cellular and intracellular structures that carry out certain functions. For example, Lung involves all structures that facilitate diffusion and transport of gases (O_2 and CO_2) as well as oxidative phosphorylation and synthesis of ATP molecules. Therefore, regardless of the cause of "breathlessness" or shortness of breath from the modern perspective, the points on the channel of Lung are used to treat it.

DISCUSSION

Since the time acpuncture was introduced in the United States and Europe, discussion and debate about the nature of "acupoints," "channels," and "collaterals" has continued. There have been fewer questions about "organs," perhaps, because of appearing like classic organs from the modern point of view.

Scientific medicine made a large step ahead when R. Virchow claimed that disease was pathology of cells, but at the same time, any extracellular disorders were almost ignored or deemed "functional diseases." Conceivably, the conception of "cellular medicine" was a reason why Traditional Chinese Medicine's ideas about "holes," "channels," or "tunnels" distributed into the human body have been hard to become accepted.

Thus, the concept of *organ* in TCM includes the set of cellular and intracellular structures that carry out certain functions. For example, Lung involves all structures that facilitate diffusion and transport of gases (O_2 and CO_2) as well as oxidative phosphorylation and synthesis of ATP molecules. Therefore, regardless of the cause of "breathlessness" or shortness of breath from the modern perspective, the points on the channel of Lung are used to treat it.

CONCLUSIONS

We believe that ancient Chinese doctors understood the complexity of the human body and divided it into 2 morpho-functional parts: cells and intercellular spaces. Through the theory of "Channels and Collaterals," those ancients described physiology and pathology of intercellular spaces. By the theory of "Zang and Fu Organs," they described cellular physiology and pathology.[39]

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Address correspondence and reprint requests to:
Mikhail Teppone, MD, DAc
AcuTech International, Inc.
4866 Bathurst Street, Suite 508
North York, M2R 1X4
Canada

E-mail: teppone@rogers.com

Федеральное агентство по здравоохранению и социальному развитию
Федеральный научный клинико-экспериментальный центр традиционных
методов диагностики и лечения

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Изучая различные системы соответствия, Пак Чжэ Ву создал собственную оригинальную теорию формирования систем соответствия, которую назвал Гомо-системой воплощений (системой подобия и отражения).

Гомо-система воплощений устроена так, что каждая часть тела, обладающая признаком функциональной или структурной целостности, содержит в себе информацию о состоянии всего тела и отдельных его частей. Структурно-функциональной единицей Гомо-системы является система соответствия, являющаяся энергоинформационной копией организма. При этом в системе соответствия отражается анатомическое и функциональное состояние организма.

Гомо-система воплощений организована по определенным принципам, знание которых позволяет найти на любом участке тела наиболее активные точки для лечения различных заболеваний.

Принципы организации Гомо-системы воплощений:

1. Сответствие телу или его отдельной части занимает всю область единичной структуры тела, повторяя ее размеры и очертания. В любой системе соответствия сохраняются пропорции отражаемого тела или органа.

2. Любая система располагается симметрично относительно центральной линии той части тела, на которую она проецируется. При этом с одной стороны от центральной линии находится соответствия правой половине отражаемой структуры, а с другой стороны – левой.

3. Ян-сторона тела (органа) проецируется на Ян-поверхности целостных частей и структур тела. Инь-сторона тела (органа) проецируется на Инь-поверхности целостных частей и структур тела.

4. Информация о любой части тела попадает не только в ее точку соответствия, но и передается посредством осей отражения в другие точки системы соответствия. Таким образом можно говорить о существовании двух типов точек в системах соответствия: лечебных точек соответствия и отраженных точек.

5. Любая часть тела, имея собственную систему соответствия, одновременно является частью более крупной структуры тела, на которой располагается система соответствия большего размера. Но при этом она состоит из отдельных частей, имеющих свои системы соответствия меньшего масштаба. Следовательно, в Гомо-системе происходит совмещение систем соответствий разных уровней.

6. Любая часть тела одновременно проецируется во все целостные структуры организма, поэтому в Гомо-системе присутствует огромное число энергетически взаимосвязанных систем соответствия.

Понимание принципов организации иерерхической Гомо-системы воплощений позволило систематизировать имеющиеся эмпирические знания о расположении рефлексогенных зон кистей, стоп и других областей тела. Использование критерия подобия позволило описать новые, неизвестные ранее системы соответствия: системы соответствия внутренним органам, системы соответствия туловища, конечностей, аурикулярные эмбриональные системы и др.

Таким образом, подобие (отражение сущности макросистемы на различных уровнях организации человека) является универсальным ключом к пониманию формирования различных систем соответствия. Описанные Пак Чжэ Ву принципы строения и функционирования Гомо-системы тела, основанные на принципах структурного подобия, позволяют легко ориентироваться в огромном количестве систем соответствия, находить самые эффективные лечебные точки воздействия, добиваясь быстрого и стабильного результата лечения.

НОВЫЙ ВЗГЛЯД НА ТЕОРИЮ КАНАЛОВ, КОЛЛАТЕРАЛЕЙ И ОРГАНОВ

Теппоне М., Авакян Р.
ООО "АкуТех",
Москва, Россия

Введение. Несмотря на то, что в развитых странах имеется тенденция к получению медицинской помощи у докторов, использующих альтернативную медицину, тем не менее, можно говорить о том, что в настоящее время по-прежнему существуют две различные медицинские системы: современная западная и традиционная восточная или китайская медицина.

Хочется верить, что медицина будущего сможет объединить в себе современные технологии и многовековой опыт народных оздоровительных методов. Основными препятствиями к такой интеграции являются различия во взгляде на природу человека и необычность терминов, используемых в традиционной китайской медицине (ТКМ).

Нужно ли сохранять оригинальный язык ТКМ или можно найти эквивалентные термины, имеющиеся в современной научной медицине? Оправдан ли анализ состояния пациента на основании принципов "Инь – Ян", "Полнота – Пустота" и "5 Элементов", или необходимо заменить их такими понятиями, как симпатический и парасимпатический отделы вегетативной нервной системы, доминанта, парабиоз, теория функциональных систем, система кининов, эндорфинов и т.д.?

Мы надеемся, что после прочтения этой статьи некоторые трудные аспекты ТКМ обретут ясный смысл, а универсальные законы природы станут доступными в ежедневной медицинской практике.

Общая теория ТКМ. Согласно взглядам традиционной китайской медицины, Qi (энергия) и кровь циркулируют внутри организма по определенным путям, описываемым терминами "каналы и коллатерали". Благодаря такой циркуляции обеспечивается нормальное функционирование отдельных органов и организма в целом. Среди этиологических факторов выделяют внутренние причины, к которым относятся наследственность (Yuan Qi) и чрезмерные эмоции, и внешние причины, или метеофакторы, такие как холод, ветер, жар, сырость и сухость. Любые заболевания можно описать как состояние "полноты" или "пустоты" определенных каналов и органов. Лечебные мероприятия направлены на восстановление нормальной циркуляции и баланса Qi и крови в организме.

Математическая модель человеческого организма. Принципы и понятия, используемые в ТКМ, первоначально возникли в древней восточной философии и поэтому имели очень широкой смысл. В современной науке, напротив, используются термины, имеющие вполне определенное значение. Поэтому, прямой перевод терминов ТКМ на современный научный язык всегда приводит к потере части смысла, который был первоначально заложен в этот термин.

Вероятно, теорию ТКМ можно представить как простейшую математическую модель, описывающую физиологию и патологию человеческого организма. Использование этой модели, в которой законы ТКМ представлены в виде алгебраических формул, позволяет понять особенности протекания заболевания у конкретного пациента и подобрать индивидуальный рецепт лечения. Это предположение справедливо не только для хорошо изученных заболеваний, но даже и для случаев, когда этиология и патогенез не известны, диагностика затруднена, а современные методы лечения еще не разработаны.

Точки акупунктуры. Кожа человека и животных характеризуется морфологической и функциональной неоднородностью. Аналогичная морфо-функциональная неоднородность выявлена у растений и некоторых насекомых [1,2]. На языке традиционной китайской медицины (ТКМ) неоднородность кожи описана как «кожные зоны», «точки акупунктуры», «каналы» и «коллатерали».

Большинство авторов, проводивших морфологические исследования в области точек акупунктуры, утверждают, что каких либо необычных структурных элементов, отсутствующих в других участках тела, выявлено не было. Основу точки акупунктуры (ТА) формирует рыхлая соединительная ткань с «вкраплением» большого количества нервных рецепторов и свободных нервных окончаний, развитой сосудистой системой, клеточными элементами, содержащими биологически активные вещества, и скопление щелевых соединений [3-7].

Электрическое сопротивление кожи, в среднем, имеет порядок около 1-2 МОм, а в области выхода ТА оно снижается до 20-60 КОм [8-11]. Благодаря низкому сопротивлению, точки акупунктуры можно визуализировать в поле высокочастотного коронного разряда, образованного аппаратом АкуВижн [12]. Электрическая неоднородность кожи сохраняется в течение нескольких дней после смерти [13-15]. Постепенно, за счет аутолитических процессов, происходящих в трупе, физические параметры кожи выравниваются, и электрическая неоднородность исчезает.

Помимо электрической аномалии в области ТА выявляются периодические колебания с частотой 7-10 и 15-20 Гц [16], спонтанное электромагнитное излучение в видимой части спектра [17], относительно высокое проведение естественного солнечного излучения [18], повышенная чувствительность к высокочастотному электромагнитному излучению [19-20] и повышенное накопление радиоактивного фосфора [21].

Учитывая вышеперечисленное, а также китайский термин "кун сюэ", используемый для обозначения ТА и переводимый как "отверстие" или "щель", мы можем прийти к заключению, что точки акупунктуры – это места на коже, где имеется разрыхление поверхностного эпителия и формируется "вход" внутрь тела. Скопление активных элементов в области этого "отверстия" превращают "точку" в сложную функциональную единицу, обеспечивающую взаимодействие внутренней и внешней среды организма.

Система каналов и коллатералей. Согласно теории ТКМ в организме человека и животных Qi и кровь циркулируют по определенным путям, называемым каналами. Выделяют 12 главных каналов и их вторичные сосуды, такие как сухожильно-мышечный, Ло-продольный и особый каналы, а также 8 "чудесных" сосудов.

В настоящее время существует, по крайней мере, две точки зрения относительно природы каналов и коллатералей. Согласно одной из них, "каналы" – это воображаемая линия, связывающая между собой функционально близкие точки. При этом реальная связь между ТА осуществляется за счет различных структур нервной, эндокринной и других регулирующих систем организма [22,23]. При такой трактовке каналов оправдано использование термина "меридиан".

Но имеются экспериментальные данные, позволяющие предположить, что между точками одного и того же канала все же имеется непосредственная взаимосвязь. Например, вдоль канала распространяются электрический ток [24,25], тепло [26], видимый свет [27], радиоактивные изотопы [28] и специфические ощущения [29], возникающие во время процедуры иглоукалывания.

Методология современного исследования предполагает наличие связи специфической функции с определенной структурой биологического объекта. Но морфологические исследования, проведенные в течение последних 50-60 лет, не выявили каких-либо специальных структур, характерных для "канала".

Однако, в ряде случаев, отсутствие структуры обеспечивает дополнительную – проводящую функцию, например, "оконный или дверной проем", "щель" или "русло реки" и т.д. Таким образом, каналы можно представить как систему "щелей", протянувшихся между другими, хорошо известными анатомическими образованиями. Поверхности мышц, сосудов, нервов, костей и других структур формируют наружные стенки, так называемых "каналов". Эти "щели" заполнены продольно ориентированной волокнистой соединительной тканью, основным веществом, растворами электролитов и структурированной водой [30-31]. Вероятно, этого достаточно, чтобы обеспечивать функцию "проведения" Qi.

Такое толкование каналов соответствует морфологическим данным, полученным доктором Ким Бон Ханом [32] и описанию каналов в трудах китайского мастера Ли Шичжэна: "…во внутреннем пространстве есть тоннели, мысленно обращающий взор в себя может осветить их…" [33].

В теории и эксперименте показано, что непосредственный информационный межклеточный обмен осуществляется при участии электромагнитных полей в диапазоне частот $10^{11} – 10^{14}$ Гц [27,34]. В тоже время из радиофизики известно, что для таких частот передающей системой могут служить диэлектрические волноводы. Передача низкочастотных сигналов успешно реализуется посредством нервных волокон. А передача высокочастотных сигналов может быть реализована лишь по каналам, представляющим собою волноводную структуру. Поэтому, "канальная" система является основным претендентом для передачи высокочастотных сигналов, генерируемых клетками. Теоретические и экспериментальные работы подтверждают, что "каналы" могут играть роль волноводов, по которым распространяются электромагнитные волны различного диапазона [13,19,27].

Вероятно, "каналы" являются самостоятельной и наиболее древней (в филогенетическом и онтогенетическом смысле) регулирующей системой организма [35-37]. Морфологическая и функциональная простота обусловливает проблемы ее верификации, поскольку канальная система "…слишком примитивна с точки зрения современной биологии…" [38]. Но, являясь базовой, она объединяет между собой все остальные, более сложные и более молодые системы макроорганизма, а также обеспечивает взаимодействие внутренней среды организма с внешним окружением [35-37].

Учитывая вышесказанное, мы можем предполагать, что посредством теории каналов и коллатералей врачи древнего Китая описали физиологию и патологию межклеточного пространства и полостей нашего организма.

Можно попытаться найти корреляцию между каналами, вторичными сосудами и определенными структурными образованиями, но это взаимоотношение носит больше функциональную основу, чем морфологическую. В зависимости от характера заболевания и его последствий, можно определить его связь с тем или другим вторичным сосудом. Например, в случае воспалительного процесса в коже и подкожной клетчатке, характеризующегося покраснением, отеком, повышением локальной чувствительности и температуры, можно диагностировать синдром "полноты" сухожильно-мышечного канала, проходящего через зону повреждения. Если же, при этом выявляется сокращение соответствующих мышц или сухожилий, а после выздоровления остается келлоидный рубец или незаживающая рана, то эти симптомы указывают на вовлечение в заболевание Ло-продольного канала. Если же, помимо местных симптомов, имеются общие проявления заболевания с признаками развития общего или специфического адаптационного синдрома, то это будет отражать патологию главного канала и, возможно, органа.

Типичным примером "щелевой модели канала" является задний срединный канал. Он начинается в почках, спускается к промежности через матку или предстательную железу. Далее, одна из ветвей поднимается вверх вдоль позвоночника, проходит по черепу и заканчивается на верхней губе. В области 16-й точки этого канала начинается ответвление, проникающее в полость черепа.

Что является анатомическим соответствием заднего срединного канала: спинной мозг или позвоночник или … ? Мы полагаем, что задний срединный канал соответствует позвоночному каналу, а ответвление в череп и точка ТМ-16 (Фэн Фу) – большому затылочному отверстию. Анализируя аналогичным образом передний срединный канал, можно предполагать, что он соответствует брюшной и грудной полостям. Исходя из описываемой физиологии, оба срединных канала регулируют органы, находящиеся в этих полостях.

Таким образом, "каналы" это не органы, ткани или клетки, а межклеточное пространство и полости человеческого организма. Проводя параллель с современной медициной, мы можем отнести патологию каналов к функциональным нарушениям, когда имеются симптомы заболевания, но отсутствуют видимые изменения в клетках.

Органы ИНЬ (ZANG) и органы ЯН (FU). В ТКМ выделяют 12 главных органов, таких как, легкие, селезенка-поджелудочная железа, сердце, почки, перикард, печень, толстая и тонкая кишка, желчный пузырь, желудок, мочевой пузырь и тройной обогреватель (San Jiao). Первые 6 органов относятся к категории Инь, т.е. являются плотными органами, имеющими паренхиму, а следующие 6 органов относятся к категории Ян, т.е. являются полыми органами. Инь и Ян органы, объединенные в пары, формируют один из 5-ти элементов системы, описывающей принципы взаимодействия между органами.

Плотные органы внутри имеют небольшие полости, например, в легких находятся бронхи, в почках – чашечно-лоханочная система, в печени – желчевыводящие пути и т.д., которые уже относятся к полым органам. В то же время, полые органы имеют снаружи паренхиматозную стенку, относящуюся к плотным органам. Поэтому, камень в почке, фактически находится в мочевом пузыре, а язвенный дефект слизистой оболочки желудка является проявлением патологии селезенки-поджелудочной железы.

В термин “орган” в ТКМ вкладывается гораздо более широкий смысл, чем в хорошо известное анатомическое образование. Большинство клеток имеют стандартный набор органелл, таких как ядро, комплекс Гольджи, эндоплазматическую сеть, митохондрии и др. Каждая органелла обеспечивает реализацию определенных функций. Процесс окислительного фосфорилирования и синтез АТФ осуществляется в митохондриях, синтез сложных биологически активных молекул и накопление микроэлементов происходит в комплексе Гольджи, за развитие и постоянство формы клетки, а также ее смерть отвечает клеточное ядро.

В каждой клетке функцию отдельных органов можно локализовать в определенных органеллах, например дыхание (“легкие”) – в митохондриях, пищеварение и транспорт питательных веществ (“поджелудочная железа”) – в эндоплазматической сети, функцию накопления биологически активных молекул (“печень”) – в комплексе Гольджи, функцию поддержания гомеостаза, развития и смерти (“почки”) – в клеточном ядре.

Исходя из вышесказанного, мы можем предположить, что в ТКМ под терминами органов описываются функции и патологические процессы, происходящие в клетках человеческого организма.

Например, термин “легкие” используется для обозначения функциональной системы, результатом действия которой является синтез Qi или энергия молекул АТФ. Эта функциональная система включает дыхательный центр, регулирующий весь процесс дыхания; легкие, участвующие в обеспечении функции внешнего дыхания; эритроциты, осуществляющие транспорт газов; и митохондрии, завершающие синтеза АТФ. Поэтому, независимо от этиологии, патогенеза и локализации заболевания, при наличии одышки необходимо проводить воздействие на точки канала легких. Если имеет место инспираторная одышка и кашель, усиливающийся на выдохе, это указывает на синдром пустоты “легких” и предполагает тонизирование соответствующих точек. Если имеет место экспираторная одышка и кашель, усиливающийся на вдохе, это указывает на синдром полноты “легких” и предполагает торможение соответствующих точек.

Дискуссия. С начала проникновения акупунктуры в Европу и Америку, не прекращаются споры относительно природы каналов и точек. Вероятно, было меньше дискуссий относительно органов, которые напоминали известные понятия в классической медицине.

Современная биологическая наука сделала большой шаг вперед, когда Р.Вирхов заявил, что “заболевание – это патология клеток”, но с этого же времени межклеточное пространство выпало из поля зрения ученых, а изменения в нем обычно трактовались как функциональные нарушения или заболевания соединительной ткани [39]. Возможно, именно концепция клеточной патологии была причиной того, что идея ТКМ о ‘щелях’, ‘каналах’ или ‘туннелях’, разветвляющихся в нашем организме, не нашла адекватного восприятия.

Заключение. Исходя из вышесказанного, мы понимаем, что человеческий организм можно разделить на клетки и межклеточное пространство. С помощью теории “каналов и коллатералей” врачи древнего Китая описали физиологию и патологию межклеточного пространства, а с помощью теории “органов” – физиологию и патологию клеток [40].

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Detection and Visualization of low resistance point of the skin by the AcuVision device

M.Teppone, R.Avakyan

IN CAM Mini-Symposium. From Experience to Evidence, Montreal, Quebec, February 2, 2007 (Poster).

Skin heterogeneity: The skin of both humans and animals is characterized by morphological and functional heterogeneity. In traditional Chinese medicine this heterogeneity is described as Acupoints, Channels, and Collaterals.

Acupoints: Loose connective tissue with large numbers of nerve receptors, free nerve endings, extensive microcirculatory system and cells with biologically active substances form the morphological basis for acupoints. Skin resistance varies from 1 to 2 mega-ohm, but at the site of acupoints entrance it decreases to 20-60 kilo-ohm. This electrical heterogeneity of skin can still be detected during the first few days after death.

Visualization of acupoints: Due to low resistance of skin at the site of acupoints, one may visualize them by high voltage corona discharge formed by AcuVision device. The initially grounded biological object covered with a thin dielectric medium (a paper, cotton fabric, polyester film, etc) is located in an electrostatic field of the high-voltage corona discharge. Power lines of the field are concentrated in the points of minimal electrical resistance on a surface of bio-object. On border "air - dielectric" transformation of the corona discharge into the spark discharge occurs, thus there is a luminescence as a bluish light, and the patient feels weak pricking. The greatest brightness of a luminescence is observed in the field of the maximal concentration of an electrostatic field, i.e. above points of the minimal electric resistance. Diagnostic criteria are brightness of a luminescence and time of a relaxation.

AcuVision device can be applied for air-ions therapy and electro-puncture also.

КВЧ – Терапия поясничного болевого синдрома

Михаил Теппоне, Ромен Авакян

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Болевой синдром в области поясницы является одной из наиболее часто встречающихся проблем нашего времени, снижающей трудоспособность и ухудшающей качество жизни пациентов молодого и среднего возраста. Различные медикаментозные и не медикаментозные методы лечения, включая оперативные вмешательства на позвоночнике, используются в зависимости от патогенеза и тяжести течения заболевания.

К эффективным и безопасным не медикаментозным методам лечения болевого синдрома относятся массаж, мануальная терапия, иглоукалывание, прижигание и, а также их современные аналоги, такие как электроимпульсная терапия, лазеротерапия, крайне высокочастотная терапия и др., объединяемые термином «квантовая медицина». Под этим термином подразумеваются различные методы диагностики и лечения, при которых используется низкоинтенсивное электромагнитное излучение (ЭМИ) и системный (холистический) подход к организму человека.[1]

Крайне высокочастотная (КВЧ) терапия является относительно новым методом лечения, основанным на различных биологических эффектах низко интенсивного ЭМИ миллиметрового диапазона. Экспериментальные и клинические исследования показали, что ведущее значение в повышении эффективности лечения принадлежит точке или зоне воздействия, а выбор точек акупунктуры (ТА), используемых в терапии, успешно решен в рамках традиционной китайской медицины (ТКМ). На основании жалоб больного и анамнеза заболевания, внешнего осмотра, исследования поверхности языка и пальпации пульса устанавливается синдромный диагноз ТКМ, который определяет выбор ТА и режим лечения.[2]

ТКМ предполагает наличие в организме животных и человека «каналов и органов». По каналам циркулирует «энергия и кровь», обеспечивая функционирование соответствующих органов и их защиту от «внешних повреждающих факторов». Любые заболевания каналов можно описать, как «нарушение циркуляции энергии» с ее избытком – «полнота» или недостатком – «пустота». Лечебные процедуры, направлены на восстановление «энергетического гомеостаза». Они сопровождаются сенсорными реакциями, описываемыми как феномен «движения энергии или Qi».[3]

Современный взгляд на теорию «каналов» позволяет рассматривать ее как описание физиологии и патологии межклеточного пространства.[1] В зависимости от описываемого межклеточного пространства выделяют «главные» каналы, «сухожильно-мышечные» каналы, «Ло-продольные» и «особые или дивергентные» каналы. Кроме того, известны, так называемые, «чудесные каналы», объединяющие главные каналы в сложные функциональные системы.

Согласно теории ТКМ в области позвоночника проходят несколько каналов, патология которых может формировать болевой синдром в области поясницы. Наиболее часто при болях в пояснице вовлечены следующие каналы: каналы Мочевого пузыря, Почек и Желчного пузыря, а также «чудесные каналы», такие как задний срединный канал (Ду Май), опоясывающий каналы (Дай Май), Ян Цзяо Май, Ян Вэй Май и Чун Май. Каждый из них имеет определенную клиническую картину и предполагает специальный набор точек акупунктуры. Дифференциальная диагностика пораженного канала проводится на основании локализации болей и ее иррадиации. Характер болей и сопутствующие симптомы позволяют дифференцировать «синдром полноты» и «синдром пустоты». На языке современной патофизиологии «полнота» соответствует доминанте А.Ухтомского, «пустота» одной из фаз парабиоза Н.Введенского.[1]

Важное дифференциально-диагностическое значение имеют такие симптомы, как:

- повышение или снижение кожной чувствительности в зоне локализации боли, что отражает «полноту» или «пустоту» сухожильно-мышечного канала;
- усиление или ослабление болей при наклоне в больную и здоровую сторону, что отражает патологию соответствующего Ло-продольного канала;
- изменение функции внутренних органов, связанных с каналами, проходящими через зону болевого синдрома.

Определенное дифференциально-диагностическое значение имеют такие факторы как, причина возникновения болей, длительность болевого синдрома, ухудшение или улучшение в определенном положении тела и др.[3-4] Например, при болях, усиливающихся в положении стоя, используются точки на канале Почек; при болях, усиливающихся при ходьбе, требуется добавлять точки на канале Печени; при болях, усиливающихся в положении сидя, требуется добавлять точки на канале Селезенки Поджелудочной железы; при болях, усиливающихся в положении лежа, требуется добавлять точки на канале Легких, и т.д.

Обобщая различные варианты болей в пояснице, можно говорить о необходимости использования точек на каналах Почек и Мочевого пузыря.

Приведем несколько вариантов поясничного болевого синдрома и рекомендаций по его лечению:

У мужчин, при острой боли, иррадиирущей в нижнюю конечность, усиливающейся при наклоне в больную сторону и возникшей после переохлаждения или физической нагрузки, необходимо тормозить точки «чудесного» канала Ян Цзяо Май [V-59 (Фу Ян), V-62 (Шэнь Май), V-61 (Пу Шэнь)] и тонизировать точку канала Мочевого пузыря V-67 (Чжи Инь). У женщин, при таких же болях необходимо тормозить точку «чудесного» канала Инь Цзяо Май R-8 (Цзяо Синь) и тонизировать точку канала Почек R-7 (Фу Лю).

При острых болях, возникших после подъема тяжести и мешающих пациенту прогибаться назад, необходимо оказывать тормозное воздействие на управляющую точку «чудесного» канала Чун Май – Rp-4 (Гунь Сунь) на стороне болей.

Необходимо напомнить, что модальность воздействия при КВЧ-терапии зависит от длительности проводимой терапии. При синдроме «полноты» (доминанта) требуется длительное воздействие, как правило, сопровождающееся дискомфортными сенсорными реакциями, а при синдроме «пустоты» (парабиоз) требуется непродолжительное КВЧ-воздействие, которое сопровождается комфортными ощущениями. В обоих случаях выявляется положительная динамика объективных параметров организма и наступает положительный клинический эффект.[5]

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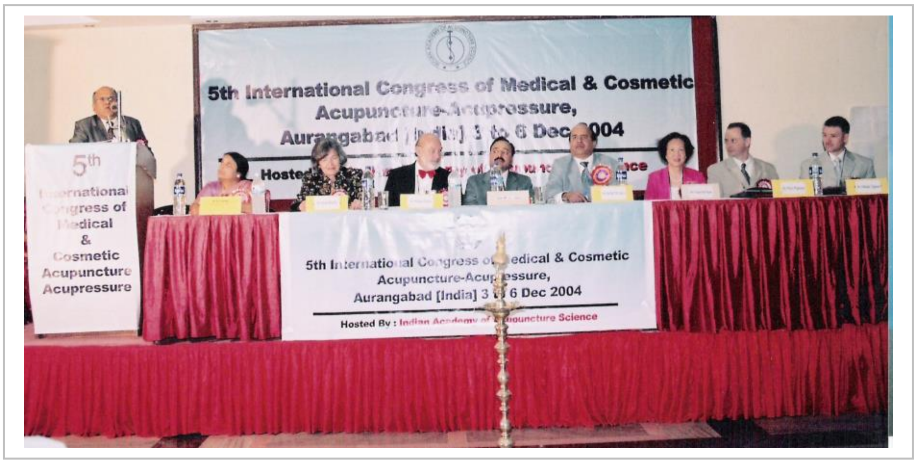
Visualization of Acupoints by Acuvision Device

Mikhail Teppone, Romen Avakyan,

The 5th International Congress of Medical & Cosmetic Acupuncture-Acupressure.
December 3-6, 2004, Aurangabad, India, p. 16-17
https://archive.org/details/visualization-of-acupoints-by-acuvision-device


5th International Congress of Medical & Cosmetic
Acupuncture-Acupressure,
Aurangabad [India] 3 to 6 Dec 2004
5th International Congress of Medical & Cosmetic Acupuncture Acupressure
Hosted By : Indian Academy of Acupuncture Science

The device "AcuVision" represents the high-voltage pulse generator with the microprocessor management, intended for visualization of points with the least electric resistance by means of their luminescence in high voltage corona discharge.

1. Acupoints, Channels and Organs

The skin of the human body is characterized by morphological and functional heterogeneity. The same heterogeneity can be found in the bodies of plants and insects [*A.Zhirmunsky et al.*, 1981; *D.Madoli*, 1984]. Several days after death electrical heterogeneity of the skin can be detected yet [*A.Zhirmunsky et al.*, 1981; *T.Croley*, 1986]. Because of autolytic process, which takes place in the cell after death, the physical parameters of the skin become equal gradually and electrical heterogeneity disappears. In terms of traditional Chinese medicine (TCM) the heterogeneity of skin is described as "Acupoints", "Channels" and "Collaterals".

In accordance with the TCM theory Qi (energy) and Blood circulates in the human body along the special pathways known as "Channels" and "Collaterals". Yet no specific structures have been revealed to confirm "channel" up to now.

We can imagine "channels" to be a system of "gaps", which are stretched out along surfaces of muscles, bones, tendons, vessels, etc. These "gaps" are filled by fibrous connective tissue, electrolytes and structured molecules of water.

It was revealed that informational interchange between cells was carried out by the electromagnetic fields, at the range of 1011 – 1014 Hz [*V.Kaznacheev et al.*, 1985; *H.Frëlich*, 1988]. Impulses of relatively low frequency can be conducted by the nervous system, but high frequency signals can be conducted by the waveguides, which could be "gaps" of the intercellular spaces. Theoretical and experimental studies have proved that "channels" can be dielectric wave-guides, which conduct electromagnetic waves of various frequency ranges [*V.Kaznacheev et al.*, 1985; *E.Andreev et al.*, 1985; *T.Croley*, 1986].

After discussion given above we can suppose that by the theory of “Channels & Collaterals” they described the physiology and pathology of the intercellular space. On the contrary by the theory of “Fu and Zang Organs” they described the physiology and pathology of cells.

All cells have about similar morphology and physiology to provide exact functions. For example, “breathing”, “digestion”, “supporting homeostasis”, etc. So, all structures, which take part at the delivery of oxygen (electron of oxygen) from outside to mitochondria and synthesis of ATP are united by the term of “Lung”: trachea, bronchus, alveolus, alveolar cell membrane, haemoglobin of red blood cells, capillaries, cell mitochondria, cytochromes, ATP-synthetasa. Structures of cells’ nuclei, including DNA molecules, are united by the term “Kidney”. Golgi complex of the cells and function of accumulation of trace elements, vitamins and various biological active substances are related to the “Liver”, etc.

2. Structure and electrical characteristics of the skin

The researches, which have been carried out in various countries have shown that conductivity of the skin varies on a functional condition of internal organs. Changes of the conductivity can be observed on any standard sites of the skin or on the sites of skin known from traditional Oriental medicine as Acupoints and reflexogenic zones [*R.Voll*, 1960; *J.Niboet*, 1955; *Y.Nakatany et al*., 1977, *etc*.].

The skin of the person and animals consists from epidermis and derma. Epidermis is submitted by the stratified flat keratinized epithelium in which constantly there is cell updating and specific cell differentiation – keratinization (fig. 1).

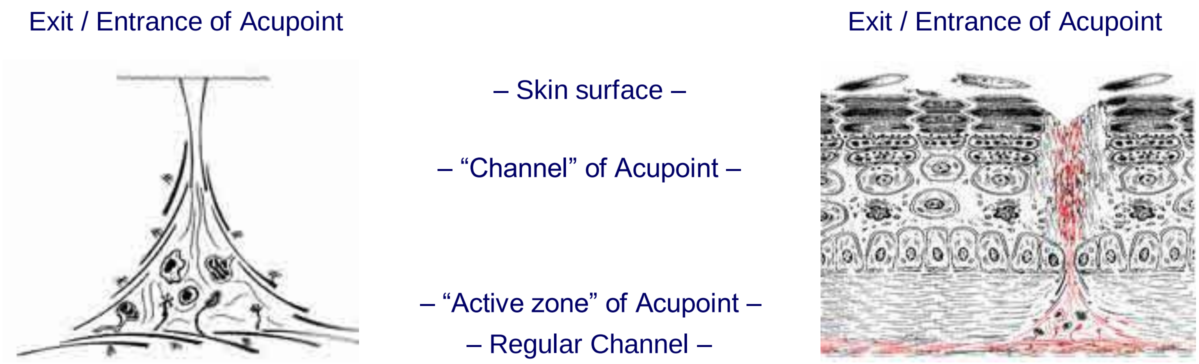

Exit / Entrance of Acupoint
Exit / Entrance of Acupoint
– Skin surface –
– “Channel” of Acupoint –
– “Active zone” of Acupoint –
– Regular Channel –

Figure 1. The schema of the skin and acupoint

Resistance of the cellular membrane is great enough (especially in keratose cells) and many times over exceeds conductivity in the micro-gaps available between cells. Therefore, it is possible to assume, that the basic contribution to conductivity of the skin (outside of Acupoints) is brought with conductivity of intercellular gaps. One may suppose that width of intercellular gaps reflects a condition of defensive energy or Wei Qi. That is why applying Kirlian’s photography to visualize diffuse conductivity they claim that it is a visualization of “AURA”.

Local conductivity at the site of Acupoints has another morphologic base. Acupoint looks like gap between muscles and tendons. It is formed by soft connective tissue with a large number of nervous receptors, free nervous endings, a developed vascular system, cell elements containing biologically active substances, and a lot of “gap” connections between cells [*N.Verzhbitskaya*, 1980; *V.Mashansky*, 1983]. The active part of the point is connected with the skin surface by means of acupoint channel, which penetrate epidermis and derma and has lower resistance than surrounding skin (fig. 1).

3. Visualization of Acupoints by AcuVision device

It is supposed, that high level of nutrient energy (*Ying Qi*) in Regular channel is accompanied by increase of its conductivity. Activity of the channel and deep part of the point is reflected on the conductivity of the point entrance/exit on the skin surface.

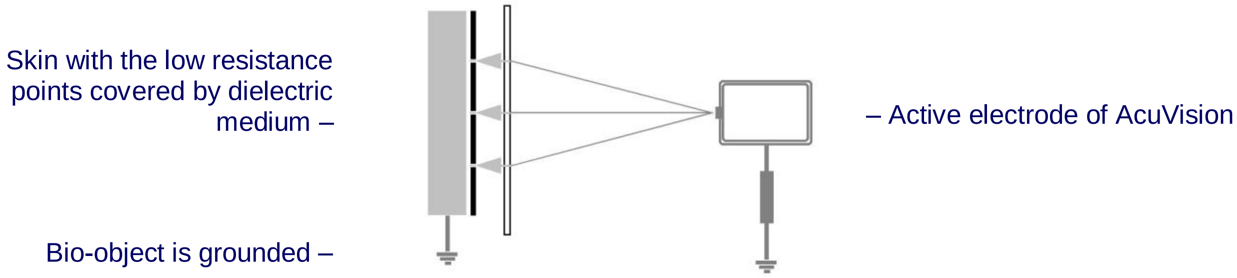

Skin with the low resistance points covered by dielectric medium –
Bio-object is grounded –
– Active electrode of AcuVision

Figure 2. Physical base of low resistance point visualization

An examined patient should be grounded before the session of low resistance points visualization. The investigated skin area must be covered with a thin dielectric medium, for example a piece of polythene, cotton fabric or paper. A high voltage corona discharge between the patient's body and active electrode are formed by "AcuVision" device (fig. 2).

Disruption of electrical field has the highest value above low electric resistance points of the skin. At these areas stimulated luminescence is observed on the dielectric medium (fig. 3). After visualization of low resistance points a doctor must estimate the received results correctly.

For a tentative estimation they analyze location, brightness and duration of the luminescence (fig. 3). These criteria are based on the experimental data showing, that the size of conducting site of the skin in Acupoints area depends on a Qi level: at a phenomenon of Excess the size of conducting window is increased, and at lack of energy (Deficiency) it decreases [*A.Podshibiakin*, 1960; *Ionescu-Tirgoviste*, 1984].

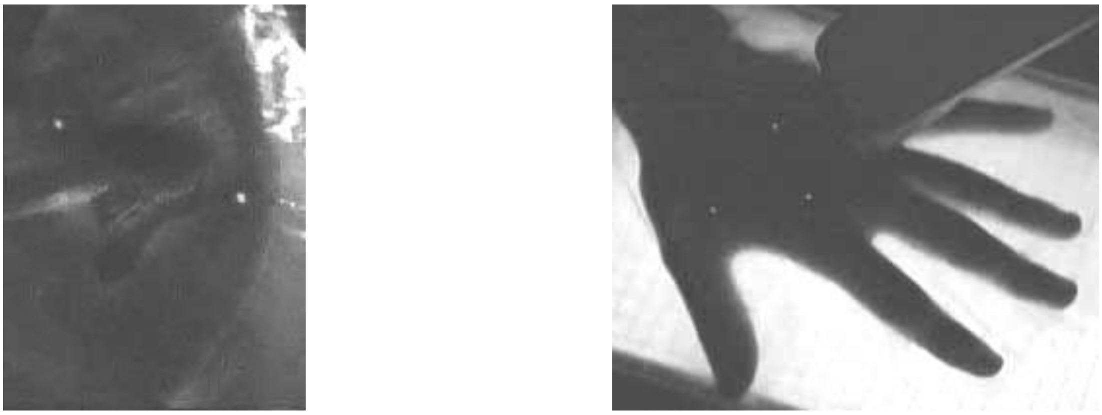


Figure 3. Examples of low resistance points visualization.*

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* - In the report published at the abstract book, pictures were not included

ДИСКУССИЯ ПО ПРОБЛЕМЕ "ТЕОРЕТИЧЕСКАЯ ОСНОВА ВОСТОЧНОЙ ТЕРАПЕВТИЧЕСКОЙ ФИЛОСОФИИ"

DISCUSSION ON ISSUE "THEORETICAL BASIS OF THE EASTERN THERAPEUTIC PHILOSOPHY".

РЕПРИНТ СТАТЬИ
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МОЖЕТ ЛИ СОВРЕМЕННЫЙ ВРАЧ ПОНЯТЬ ТРАДИЦИОННУЮ КИТАЙСКУЮ МЕДИЦИНУ?

Теппоне М., Авакян Р.

Резюме. *Проведенный анализ поможет современному врачу адекватно воспринимать теорию традиционной китайской медицины и осуществлять индивидуализацию лечения с использованием методов традиционного и аппаратного воздействие на точки иглоукалывания и рефлексогенные зоны.*

Ключевые слова. *Чжень-цзю терапия, комплексная терапия.*

WHETHER THE MODERN DOCTOR CAN UNDERSTAND THE TRADITIONAL THE CHINESE MEDICINE?

Teppone M, Avakjan R.

The resume. *The carried out analysis will help the modern doctor to perceive adequately the theory of traditional Chinese medicine and to carry out an individualization of treatment with use of methods traditional and hardware influence on points of acupuncture and a zone of reflexes.*

Keywords. *Chzhen-tszju therapy, complex therapy.*

В настоящее время в клинической практике широко используется традиционные иглоукалывание и прижигание, а также различные аппаратные методы диагностики и лечения, в основе которых лежит теория традиционной китайской медицины (ТКМ). Однако, необычность терминологии и понятий, используемых в ТКМ, препятствуют ее широкому внедрению в практическое здравоохранение.

Как известно, традиционная китайская медицина предполагает наличие в организме человека и животных «каналов и органов». По каналам циркулирует «энергия и кровь», обеспечивая нормальное функционирование соответствующих органов. Среди ведущих причин заболевания выделяют «наследственность», «чрезмерные эмоции» и «внешние повреждающие факторы». Любые заболевания каналов можно описать, как «нарушение циркуляции энергии» и формирование ее избытка – «полнота» или недостатка – «пустота». При заболевании органов вводятся дополнительные параметры «жар» и «холод». Лечебные процедуры, направлены на восстановление «энергетического гомеостаза». Они сопровождаются сенсорными реакциями, описываемыми как феномен «движения энергии».

1. Термины ТКМ имеют широкий смысл, понятный только из контекста рассматриваемых явлений. Используемые в ТКМ теории являются математическим моделированием, описывающим наиболее общие физиологические и патофизиологические законы. Применяя «алгебраические» формулы ТКМ, можно находить индивидуальные пути достижения лечебного эффекта при различных заболеваний, в том числе и тех, для которых не решены вопросы этиологии и патогенеза, где имеются затруднения с постановкой нозологического диагноза, а также не разработаны адекватные методы современного обследования и лечения.

2. Основу точки акупунктуры (ТА) формирует рыхлая соединительная ткань с «вкраплением» большого количества нервных рецепторов и свободных нервных окончаний, развитой сосудистой системой микроциркуляторного русла, клеточными элементами, содержащими биологически активные вещества, и скопление щелевых соединений [*Н.Вержбицкая и соавт.*, 1980; *В.Машанский и соавт.*, 1983].

3. Ряд специалистов по акупунктуре, придерживающихся рефлекторной теории, считают каналы воображаемой линией, связывающей функционально близкие точки, реальная связь между которыми формируется посредством нейрогуморальной системы [*Р.Дуринян*, 1981; *W.Lang*, 1976].

В тоже время, имеются экспериментальные данные, указывающие на возможность не только функциональной, но и анатомической связи между точками, принадлежащими к одному и тому же каналу. Известно, что вдоль проекции канала распространяются сенсорные реакции, возникающие при проведении акупунктуры [*Ji Zhongpu,* 1981]; электрический ток [*В.Макац*, 1984]; электромагнитные волны видимого диапазона [*В.Казначеев и соавт.*, 1985]; радиоактивные изотопы [*P. De Vernejoul P. et all.*, 1985] и т.д.

Можно предполагать, что каналы это система «щелей», протянувшихся между другими, хорошо известными анатомическими образованьями. Поверхности фасций, мышц, костей и др. структур, а также отдельных клеточных элементов формируют «наружные стенки» этих «щелей», а их внутреннее пространство заполнено соединительной тканью, межуточным веществом, растворами электролитов и структурированной водой [*А.Уманская*, 1984].

Проведение низкочастотных электрических сигналов обеспечивается нервными волокнами, а передача высокочастотных сигналов, генерируемых клеточными мембранами, вероятно, реализуется по «щелевым» или волноводоподобным структурам, что подтверждается рядом теоретических и экспериментальных работ [*Е.Андреев и соавт.*, 1985; *В.Казначеев и соавт.*, 1985; *Д. Мадоли*, 1984].

Подводя итог вышесказанному, можно сделать вывод, что теория «каналов и коллатералей» описывает физиологию и патологию межклеточного пространства, обычно выпадающего из поля зрения современной медицины.

4. В понятие «ОРГАН» традиционная китайская медицина включает гораздо более широкий смысл, чем определенное анатомическое образование.

В каждой клетке многоклеточного организма имеется стандартный набор субклеточных структур, например, ядро, митохондрии, комплекс Гольджи, плазматический ретикулум и др. Для каждой из органелл присущ определенный набор функций. Функция окислительного фосфорилирования и синтез молекул АТФ осуществляется митохондриями; синтез и транспорт белков реализуется в эндоплазматической сети; накопление белков, синтез полисахаридов и более сложных соединений происходит в комплексе Гольджи; функция регуляции развития, дифференцировки и умирания клетки принадлежит ядру.

В большинстве клеток можно выделить функцию дыхания, соответствующую «легким», функцию синтеза и хранения сложных соединений, соответствующую «эндокринным железам» и «печени», функцию регуляции возраста клетки, соответствующую «почкам» и т.д.

Таким образом, под понятием «орган» в ТКМ необходимо подразумевать весь набор клеточных и субклеточных структур, обеспечивающих реализацию определенных функций. Например, «легкие» включают в себя все структуры, обеспечивающие диффузию и транспорт газов (O_2 и CO_2), а также процесс окислительного фосфорилирования с образованием молекул АТФ. Поэтому, независимо от патогенеза симптома «одышка», его лечение осуществляется с помощью точек канала «легкие».

5. В ТКМ, из-за многообразия процессов, протекающих в человеческом организме, для оценки состояния больного используется синдромный подход и вводится интегральный параметр – «Qi», аналогичный «единому управляющему параметру» в теории кибернетики. Этот же универсальный параметр «Qi» характеризует способность клеток совершать определенную работу, т.е. производить и утилизировать универсальный источник энергии молекулу АТФ. Применение понятия «Qi» дает возможность сравнивать различные характеристики анализируемого объекта. Это сравнение проводится не в цифрах, а в сравнительных категориях: «больше», «значительно больше», «меньше», «значительно меньше» или «равно».

Таким образом, «Qi» это единый управляющий параметр, универсальная единица сравнения, а также показатель энергетического статуса рассматриваемого биообъекта.

Введение дополнительных параметров «жар» и «холод», позволяет дифференцировать преобладание в организме экзотермических или эндотермических реакций, в том числе, соотношение между окислительным фосфорилированием (синтез АТФ) и свободным окислением (выделение тепла).

6. В современной физиологии известны две теории, описывающие реакции организма на внешнее воздействие, это парабиоз Н.Введенского и доминанта А.Ухтомского:

- состояние парадоксальной фазы парабиоза характеризуется вовлечением в патологический процесс относительно малого (в связи с истощением) количества энергии и структур; для достижения лечебного эффекта необходимо оказывать энергетически слабое воздействие, поскольку раздражитель большой и средней мощности может остаться незамеченным или привести к гибели организма.

- состояние доминанты характеризуется вовлечением в патологический процесс относительно большого количества энергии и структур; для достижения лечебного эффекта необходимо оказывать энергетически сильное воздействие, поскольку слабые раздражители приводят к усилению доминантного очага;

Другими словами, система может находиться в возбужденном или заторможенном состоянии, для лечения которых требуются различные по силе воздействия.*

В ТКМ, заболевания с относительным избытком энергии описываются как состояние «полноты», а заболевания с относительным недостатком как состояние «пустоты». В первом случае требуется тормозное воздействие, во втором – тонизирующее.

7. В ТКМ выделяют группу заболеваний, вызванных внешними причинами или метеофакторами: жар, холод, сухость, сырость и ветер. С помощью этих терминов были описаны типы реагирования человека на воздействие гелио-космических факторов: жар и холод отражают теплопродукцию, сухость и сырость – водный гомеостаз, а ветер – характеризует лабильность параметров организма больного.

В эксперименте показано, что основным акцептором гелио-космических факторов являются молекулы воды биообъекта [*П.Василик и соавт.*, 1985], другими словами, одни и те же факторы действуют на молекулы паров воды в атмосфере, меняя погодные условия, и на организм больного, вызывая в нем патологические процессы.

8. Объединяя теории «доминанты» и «парабиоза», Г.Селье описал общие закономерности развития острого заболевания, выделив фазы «тревоги», «адаптации» и «истощения» [Г.Селье, 1960].

В ТКМ, этапы прогрессирования острого заболевания, вызванного внешними факторами, описываются теорией 6-ти каналов в трактате «о лихорадках, вызванных холодом» *[Zhang Zhongjing*, 1986]. Первые три уровня характеризуются клиническими проявлениями, соответствующими активацией симпатоадреналовой системы (т.е. фаза «тревоги» по Селье), последние три уровня характеризуются клиническими проявлениями, соответствующими снижению активности симпатоадреналовой и вагоинсулярной систем (т.е. фаза «истощения» по Селье).

Таким образом, понимая сложность строения и функций человеческого организма, врачи древнего Китая смогли описать наиболее общие механизмы развития патологических процессов.

Можно надеяться, что проведенный анализ поможет современному врачу адекватно воспринимать теорию ТКМ и успешно осуществлять индивидуализацию лечения при использовании методов традиционного и аппаратного воздействие на точки акупунктуры и рефлексогенные зоны.

*Кстати.** - Знаменитый английский врач Вильям Куллен (Y.Cullen, 1712-1790) и его последователь Джон Браун (J.Brown, 1735-1788) учили, что существуют только два вида болезней: астенические - при недостатке возбуждения в организме, и стенические - при избытке возбуждения. Соответственно назначались два вида лечения: при астении все возбуждающее тонус (тепло, припарки, мясо, пряности, вино); при стении - все ослабляющее (кровопускание, рвотные и слабительные, клизмы, препараты группы опия, атропин и др.).

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Современные Аспекты Квантовой и Традиционной Китайской Медицины

Михаил Теппоне, Ромен Авакян

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Квантовая медицина объединяет в себе различные методы диагностики и лечения, при которых используется низкоинтенсивное электромагнитное излучение (ЭМИ) и системный (холистический) подход к организму человека.

Квантовая диагностика базируется на измерении и анализе слабых и сверхслабых сигналов, излучаемых биологическим объектом. Среди методов квантовой диагностики широкое распростра нение получили: инфракрасное тепловидение, радиотермометрия, а также измерение или визуализация локальной и диффузной электропроводимости.

В квантовой терапии лечебный эффект достигается благодаря коррекции электромагнитных полей пациента внешним низкоинтенсивным ЭМИ. Используется когерентное и шумовое излучение видимого, инфракрасного, миллиметрового и субмиллиметрового диапазонов длин волн.

Методы квантовой медицины доказали свою высокую эффективность в лечении широкого круга заболеваний органов пищеварения и дыхания, сердечно-сосудистой и нервной системы, опорно-двигательного аппарата, а также в эндокринологии, педиатрии, наркологии, дерматологии, психиатрии и т.д.

Считается, что при воздействии на кожные покровы можно стимулировать различные компоненты иммунной и эндокринной систем, нормализовать гемостаз, микроциркуляцию и метаболизм, а также привести в равновесие перекисное окисление липидов и антиоксидантную систему организма. В последние годы большое внимание уделяется изучению обмена эндорфинов, нейропетидов, субстанции «Р» и др. Обобщая результаты исследований, можно сделать вывод, что эффективная терапия всегда сопровождается нормализацией параметров и компонентов, имеющих различные отклонения и не оказывают влияние на параметры, находящиеся в пределах нормы.

К настоящему времени имеется достаточно экспериментального и клинического материала, позволяющего утверждать, что одним из важных факторов, определяющих эффективность проводимого лечения, является адекватный выбор точек и зон воздействия.

Взгляд на человека, как на сложную функциональную систему наиболее хорошо разработан **в традиционной китайской медицине** (ТКМ), однако необычность терминологии и понятий, используемых в ТКМ, препятствуют ее широкому внедрению в практическое здравоохранение.

Традиционная китайская медицина предполагает наличие в организме человека и животных «каналов и органов». По каналам циркулирует «энергия и кровь», обеспечивая нормальное функционирование соответствующих органов. Среди ведущих причин заболевания выделяют «наследственность», «чрезмерные эмоции» и «внешние повреждающие факторы». Любые заболевания каналов можно описать, как «нарушение циркуляции энергии» и формирование ее избытка – «полнота» или недостатка – «пустота». При заболевании органов вводится дополнительный параметр «жар – холод». Лечебные процедуры, направлены на восстановление «энергетического гомеостаза». Они сопровождаются сенсорными реакциями, описываемыми как феномен «движения энергии (Qi)».[12]

1. ТКМ использует термины, имеющие широкий смысл, понятный только из контекста рассматрива- емых явлений. Разработанные в ТКМ теории являются вариантом математического моделирования, описывающего наиболее общие физиологические и патофизиологические законы. Применяя «алгебраические» формулы возникновения и развития основных патологических процессов, можно находить индивидуальные пути достижения лечебного эффекта у конкретного пациента.

2. Холистический подход ТКМ заложен в понятии «ДАО». Несмотря на то, что нет точного перевода или определения этого термина, тем не менее, в нем содержится по крайней мере, два аспекта:

(а) При изучении любой сложной системы нельзя изолированно рассмаривать ее отдельные элементы. Рассматривая отдельный элемент, необходимо учитывать его взаимодействие с остальными элементами системы. В случае изолированного изучения отдельного элемента нельзя переносить полученные результаты на всю систему.

Учитывая вышесказанное, нельзя забывать, что человек взаимодействует с окружающей природой и является ее частью, а его отдельные органы, ткани и клетки рассматриваются в ТКМ только как взаимосвязанные элементы целого организма.

(б) В развивающейся системе информация о ее будущем состоянии присутствует с самого начала. Поэтому правильней говорить не об эволюции, а о реализации потенциальных возможностей. Можно предполагать, что под понятием ДАО человека подразумевается 2-х спиральная молекула ДНК, образовавшаяся при слиянии сперматозоида и яйцеклетки. Новая ДНК содержит всю необходимую информацию, определяющую развитие, формирование и дальнейшую жизнь новорожден- ного ребенка.[10]

3. Современный взгляд на теорию «каналов» позволяет рассматривать ее как описание физиологии и патологии межклеточного пространства. Вероятно, передача высокочастотных сигналов, генерируемых клеточными мембранами, осуществляется по «щелевым» или волноводоподобным структурам, что подтверждается рядом экспериментальных работ.[4,6]

Теория плотных и полых «органов» в ТКМ описывает физиологию и патологию систем, реализующих определенные функции и объединяющих клеточные и субклеточные элементы. Например, «легкие» включают в себя все структуры, обеспечивающие диффузию и транспорт газов (О2 и СО2), а также процесс окислительного фосфорилирования с образованием молекул АТФ. Поэтому, независимо от патогенеза симптома «одышка», его лечение осуществляется с помощью точек канала «легкие».

4. В ТКМ, из-за многообразия процессов, протекающих в человеческом организме, для оценки состояния больного используется синдромный подход и вводится интегральный параметр – «Qi», аналогичный «единому управляющему параметру» в теории кибернетики,[7] и переводимый иногда, как «энергия».

Из физиологии известно, что работа клеток зависит от энергии, аккумулируемой молекулами АТФ, и фермента АТФ-азы, обеспечивающего утилизацию имеющейся энергии. Можно предполагать, что универсальный параметр «Qi» характеризует способность клетки совершать определенную работу, т.е. интегральное количество молекул АТФ.

Применение понятия «Qi» дает возможность сравнивать различные характеристики анализируемого объекта. Это сравнение проводится не в цифрах, а в сравнительных категориях: «больше», «значительно больше», «меньше», «значительно меньше» или «равно».

Таким образом, «Qi» это единый управляющий параметр, универсальная единица сравнения, а также показатель энергетического статуса рассматриваемого биообъекта.

Введение дополнительного параметра «жар – холод», позволяет дифференцировать преобладание в организме экзотермических или эндотермических реакций, в том числе, соотношение между окислительным фосфорилированием (синтез АТФ) и свободным окислением (выделение тепла).

5. В ТКМ любые заболевания можно описать как относительный избыток («полнота») или недостаток («пустота») энергии. На языке современной патофизиологии это соответствует доминанте[11] или одной из фаз парабиоза.[3] В первом случае (доминанта) требуется длительное воздействие, иногда сопровождающееся дискомфортными сенсорными реакциями, во втором случае (парабиоз) – непродолжительное воздействие, сопровождающееся комфортными ощущениями.[9] В обоих случаях выявляется положительная динамика объективных параметров организма и наступает клинический эффект.

6. В ТКМ возникновение сенсорных реакций во время лечебной процедуры является положительным прогностическим признаком, отражающим «движение Qi» и динамику состояния пациента. КВЧ-воздействие также сопровождается «сенсорным откликом» и параллельным изменением различных параметров организма человека.[1,5] Большинство авторов, анализирующих сенсорные реакции во время КВЧ-терапии, рассматривают их как критерий эффективности проводимой процедуры.[1,8,9] Схожесть модальности сенсорных реакций в ТКМ и при КВЧ-терапии позволяет отнести их к одному и тому же феномену.

7. В ТКМ выделяют группу заболеваний, вызванных внешними причинами или метеофакторами, к которым относятся жар, холод, сухость, сырость и ветер. С помощью этих терминов были описаны типы реагирования человека на воздействие гелио-космических факторов: жар и холод отражают теплопродукцию, сухость и сырость – водный гомеостаз, а ветер – характеризует лабильность параметров организма больного. В эксперименте показано, что основным акцептором гелио-космических факторов являются молекулы воды биообъекта.[2] Вероятно ЭМИ, поглощаемые водосодержащими структурами, нормализуют кристаллическую решетку воды и устраняют нарушения, вызванные факторами внешней среды.

Можно надеяться, что проведенный анализ поможет современному врачу адекватно воспринимать теорию ТКМ и успешно осуществлять индивидуализацию точек и зон воздействия при использовании лечебных методов квантовой медицины.

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Научный Совет Российской академии наук
по проблеме "Физическая электроника"
Закрытое акционерное общество "МТА-КВЧ"

Институт радиотехники и электроники

Российской академии наук

Всероссийское научно-техническое
общество радиотехники, электроники и
связи имени А.С.Попова

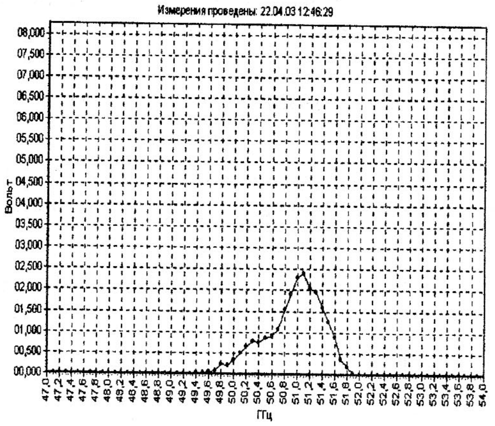
Закрытое акционерное общество "НПО-Форум"

13 РОССИЙСКИЙ СИМПОЗИУМ С МЕЖДУНАРОДНЫМ УЧАСТИЕМ

МИЛЛИМЕТРОВЫЕ ВОЛНЫ В МЕДИЦИНЕ И БИОЛОГИИ

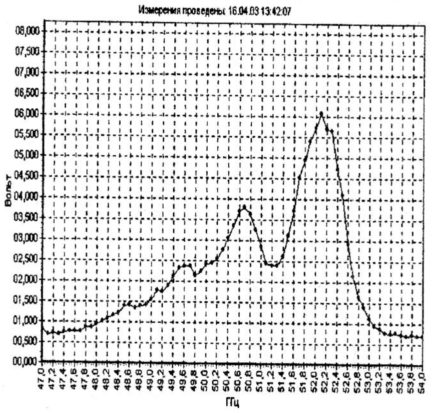
Сборник докладов

Москва, 2003



370 Перепелкина
Спектр зоны 35 з сектор 2/5

Рис. 1. Липогранулема левой молочной железы



365 Шурупо Л. Н. Спектр зоны 35s сектор 3.

Рис.2. Рак левой молочной железы $T_1N_xM_x$

В результате исследования был разработан и обоснован алгоритм обследования пациентов методом ТРФ-топографии и были получены стандартизованные формы отображения результатов.

ТРФ-топография может быть использована в дифференциальной диагностике в маммологии.

Представляется возможным применение ТРФ-топографии в качестве скринингового метода в амбулаторной практике.

TRANSRESONANT FUNCTIONAL TOPOGRAPHY USE IN THE DIAGNOSTICS OF MAMMAE TUMORS

M.S. Gromov, V.N. Plohov, V.I. Petrosyan, O.E. Losev, E.B. Nikitina, I.V. Terehov, S.A. Dubovitskii,A.V. Brizgunov, B.L. Dyagilev

КВЧ-ТЕРАПИЯ И СОВРЕМЕННЫЕ АСПЕКТЫ ТРАДИЦИОННОЙ КИТАЙСКОЙ МЕДИЦИНЫ

М.В. Теппоне, Р.С. Авакян
«Колояро-2000»

В данной работе проведены теоретические и клинические параллели между традиционной китайской медициной (ТКМ) и феноменами, описанными в литературе, посвященной крайне высокочастотной (КВЧ) терапии.

ТКМ предполагает наличие в организме животных и человека «***каналов** и **органов***». По каналам циркулирует «***энергия** и **кровь***», обеспечивая функционирование соответствующих органов и их защиту от «***внешних повреждающих факторов***». Любые заболевания каналов можно описать, как «***нарушение циркуляции энергии***» и формирование ее избытка – «***полнота***» или недостатка – «***пустота***». При заболевании органов вводится дополнительный параметр «***жар – холод***». Лечебные процедуры, направлены на восстановление «***энергетического гомеостаза***». Они сопровождаются сенсорными реакциями, описываемыми как феномен «***движения энергии*** (*Qi*)».

1. В ТКМ, используя лечебный метод Ци Гун, можно дистантно восстанавливать «энергетический гомеостаз» пациента. Считается, что из рук мастера Ци Гун выделяется защитная энергия – «Wei Qi». Сравнение сенсорных и объективно регистрируемых реакций, возникающих у испытуемого при дистантном воздействии рук оператора и генератора ММ ЭМИ, выявило наиболее выраженные эффекты на одних и тех же длинах волн в диапазоне от 2,5 до 0,3 мм [*В.Волченко и соавт.*, 1987, 1989]. Можно предполагать, что ММ ЭМИ является наиболее адекватным и эффективным фактором воздействия на систему каналов и точек акупунктуры.

2. Современный взгляд на теорию «***каналов***» позволяет рассматривать ее как описание физиологии и патологии межклеточного пространства. Вероятно, передача высокочастотных сигналов, генерируемых клеточными мембранами, реализуется по «щелевым» или волноводоподобным структурам, что подтверждается рядом экспериментальных работ [*В.Казначеев и соавт.*, 1985; *Д.Мадоли*, 1984].

Теория плотных и полых «***органов***» в ТКМ описывает физиологию и патологию систем, реализующих определенные функции и объединяющих клеточные и субклеточные элементы. Например, «легкие» включают в себя все структуры, обеспечивающие диффузию и транспорт газов (O_2 и CO_2), а также процесс окислительного фосфорилирования с образованием молекул АТФ. Поэтому, независимо от патогенеза симптома «одышка», его лечение осуществляется с помощью точек канала «легкие».

Согласно одним гипотезам рецепция электромагнитного излучения (ЭМИ) миллиметрового диапазона осуществляется межклеточным пространством с последующей передачей сигнала клеточным структурам (ЭМИ → молекулы воды и коллагена → тельца Руффини) [*И.Родштат*, 2001]. В других, предполагается непосредственно клеточная рецепция (ЭМИ → клеточная мембрана) [*Н.Девятков и соавт.*, 1991] или (ЭМИ → молекулы воды → клеточная мембрана) [*О.Бецкий и соавт.*, 1991]. Таким образом, в переводе на терминологию ТКМ можно говорить о «канальной» и «органной» рецепции, которая реализуется через молекулярные и клеточные структуры точек акупунктуры (ЭМИ → ТА → канал) [*Е.Андреев* и соавт., 1985].

3. В ТКМ из-за многообразия процессов, протекающих в человеческом организме, для оценки состояния больного используется синдромный подход и вводится интегральный параметр – «***Qi***», переводимый как «***энергия***», аналогичный «*единому управляющему параметру*» в теории кибернетики [*С.Бир*, 1967 по *Г.Овчинникова*, 1995]. Известно, что работа клеток зависит от энергии, аккумулируемой молекулами АТФ, и фермента АТФ-азы, обеспечивающего утилизацию имеющейся энергии. Можно предполагать, что универсальный параметр «Qi» характеризует способность клетки совершать определенную работу или общее количество молекул АТФ. Введение дополнительного параметра «жар – холод», позволяет дифференцировать преобладание в организме экзотермических или эндотермических реакций, в том числе, соотношение между окислительным фосфорилированием (синтез АТФ) и свободным окислением (выделение тепла).

Имеются гипотезы, согласно которым КВЧ-волны влияют на процессы тканевого дыхания, синтез и утилизацию АТФ [*И.Петров и соавт.*, 1989; *Ю.Лиманский и соавт.*, 1996]. В конечном итоге, меняется содержание молекул АТФ, т.е. количество «энергии» или «Qi».

4. В ТКМ любые заболевания можно описать как относительный избыток («полнота») или недостаток («пустота») энергии. На языке современной патофизиологии это соответствует доминанте [*А.Ухтомский*, 1966] или одной из фаз парабиоза [*Н.Введенский*, 1952]. В первом случае (доминанта) требуется длительное КВЧ-воздействие, иногда сопровождающееся дискомфортными сенсорными реакциями, во втором случае (парабиоз) – непродолжительное КВЧ-воздействие, сопровождающееся комфортными ощущениями [*М.Теппоне и соавт.*, 1992]. В обоих случаях выявляется положительная динамика объективных параметров организма и наступает клинический эффект.

5. В ТКМ возникновение ***сенсорных реакций*** во время лечебной процедуры является положительным прогностическим признаком, отражающим «движение Qi» и динамику состояния пациента. КВЧ-воздействие также сопровождается «сенсорным откликом» и параллельным изменением различных параметров организма человека [*Е.Андреев* и соавт., 1985; *Н.Лебедева и соавт.*, 1989]. Большинство авторов, анализирующих сенсорные реакции во время КВЧ-терапии, рассматривают их как критерий эффективности проводимой процедуры [*Е.Андреев* и соавт., 1985; *С.Ситько и соавт.,* 1994; *М.Теппоне и соавт.*, 1992; *С.Шевченко и соавт.*, 1996]. Схожесть модальности сенсорных реакций в ТКМ и при КВЧ-терапии позволяет отнести их к одному и тому же феномену.

6. В ТКМ выделяют группу заболеваний, вызванных внешними причинами или метеофакторами: *жар*, *холод*, *сухость*, *сырость* и *ветер*. С помощью этих терминов были описаны типы реагирования человека на воздействие гелиокосмических факторов: *жар* и *холод* отражают теплопродукцию, *сухость* и *сырость* – водный гомеостаз, а *ветер* – характеризует лабильность параметров организма больного. В эксперименте показано, что основным акцептором гелиокосмических факторов являются молекулы воды биообъекта [*П.Василик и соавт.*, 1985]. Вероятно, КВЧ-волны, поглощаемые водосодержащими структурами, нормализуют кристаллическую решетку воды и устраняют нарушения, вызванные факторами внешней среды.

Таким образом, схожесть явлений, описываемых в литературе по ТКМ и КВЧ-терапии, позволяет предполагать, что лечебное использование искусственного ММ ЭМИ – это развития традиционной китайской медицины с привлечением достижений современной науки.

EHF-THERAPY AND THE MODERN ASPECTS OF TRADITIONAL CHINESE MEDICINE

M.V. Teppone, R..S. Avakyan

КВЧ-ТЕРАПИЯ – МЕТОД РЕАБИЛИТАЦИИ В ЛЕЧЕНИИ МАСТОПАТИИ

О.В.Григорьева
Больница УД МИД РФ, Московская обл., Щелковский р-н, п.Юность

Предопухолевые заболевания, на фоне которых возникает рак, объединяются под общим названием «мастопатия». Значение мастопатии в развитии рака молочных желез является бесспорным и в настоящее время рассматривается как предраковое заболевание.

Quantum Therapy in the Physiotherapy Field

Mikhail Teppone, Romen Avakyan

«What's new in Physiotherapy – 2003», Beirut, Lebanon, 6-7 September 2003, p. 31
https://archive.org/details/2003-quantum-therapy-in-the-physiotherapy-field

Quantum Medicine (QM) uses the phenomenon according to which all the processes following vital activity of living organism are distinctly reflected in the pattern of electromagnetic (EM) information field existing around and within the organism.

Quantum Medicine declares that human body is a whole system (holistic approach) or a system of electromagnetic fields. «Channels» or «Meridians» well known from traditional Oriental medicine are considered to be intercellular spaces or gaps between tissues and organs. Electrical pulses of relatively low frequency can be conducted by the nervous system, but high frequency EM waves can be conducted by «channels» or wave-guides.

Quantum Medicine is based on the various biological effects produced in human body by a low-intensity electromagnetic fields in various spectrum of waveband. Three types of EM radiation are used in practice: coherent, which has a fixed frequency and constant phase, and «noise-like» having a broad spectrum, with randomly varying amplitudes and phases, and its combination. Because of the fact that QM uses low-intensity EM waves, so they discuss informational or energy–informational mechanism of interaction between EM fields and human organism.

Quantum Medicine includes functional (quantum) diagnostic, therapy and prophylactic.

Quantum diagnostic: Any healthy or abnormal states of the body can be described by the frequency, phase or amplitude parameters of the fields. Variations of the human body fields can be detected ahead of structural (cellular or tissue) disorders, so quantum diagnostic provides early detection of various diseases, for example: infrared imaging system detected temperature abnormalities on the skin surfaces, but microwave imaging system detected temperature abnormalities of the tissues at different depths, both of these methods reflect condition of internal organs; measurement of skin electrical field distribution provides functional assessment of Acupoints, channels, tissues and organs as well as a whole body, for example: R.Voll, Rodoraku methods, Vega test, etc.

Quantum therapy: Any disease is suggested to be a disorder of EM homeostasis, which can be caused by the external factors (external EM fields) or internal factors (emotional stress, improper diet, heredity, etc.). Quantum therapy uses ecologically harmless modalities of EM radiation for restoring the disease–affected electromagnetic information field of the patient and providing a stable state of EM homeostasis. The following most effective modes of electromagnetic radiation have been selected on the base of long-term studies: magnetic field, low-intensity infrared laser radiation, wide-band infrared radiation, low-intensity electromagnetic radiation in the millimeter spectrum of waveband, red, green and blue visible light, etc.

Стандартное описание методик КВЧ-терапии

Теппоне М.В., Авакян Р.С.

ООО «Колояро-2000»

С целью стандартизации описания КВЧ-терапии предлагается унифицированная формула, в которую вводится название методики, используемый аппарат, основные характеристики излучения, локализация воздействия и другие параметры проведения лечебной процедуры.

Крайне высокочастотная (КВЧ) или миллиметровая (ММ) терапия является новым методом лечения, основанным на использовании низкоинтенсивного электромагнитного излучения (ЭМИ) миллиметрового диапазона.

Первые исследования в области биологических эффектов ММ ЭМИ начаты в СССР в середине 60-х годов. К настоящему времени пройден путь от теоретико-экспериментальных работ до практического использования КВЧ-терапии в различных областях клинической и экспериментальной медицины.

Современное представление о механизмах взаимодействия низкоинтенсивного ЭМИ миллиметрового диапазона с биологическими объектами подробно описано в соответствующих обзорах [1-2].

В связи с разноообразием биологических эффектов, инициируемых КВЧ-воздействием, разработаны и широко используются различные варианты КВЧ-терапии.

С целью стандартизации описания лечебных методик предлагается унифицированная схема, представленная в виде специальной формулы. В «формулу» вводится название методики КВЧ-терапии, используемый аппарат, вид излучения, частота излучения или длина волны, мощность излучения или плотность потока мощности, модуляция излучения, локализация и длительность воздействия, количество процедур на курс и количество курсов лечения.

1. Основные методики КВЧ-терапии

В литературе, посвященной применению ММ ЭМИ, встречаются следующие варианты КВЧ-терапии: КВЧ-терапия [3-4], микроволновая резонансная терапия [5-6], информационно-волновая терапия [7-8], молекулярно-волновая терапия [9-10], КВЧ-пунктура [11-12] и др. Они отличаются друг от друга видом излучения, используемыми частотами и зонами воздействия.

Предлагаются следующая классификация и сокращенные обозначения различных методик КВЧ-терапии:

1.1. [КВЧ-С], где «С» - стандарт.

«КВЧ-С» это стандартный вариант КВЧ-терапии при котором на основании *нозологического диагноза* осуществляется выбор стандартной частоты ММ ЭМИ: 42,25 ГГц или 7,1 мм; 53,57 ГГц или 5,6 мм; 61,22 ГГц или 4,9 мм; 118,57 ГГц или 2,53 мм), стандартной зоны воздействия (грудина, затылок, эпигастральная область, крупные суставы), длительности КВЧ-воздействия (30-60 мин) и количества процедур (8-12) на курс [3-4].

В некоторых случаях осуществляется выбор одной из стандартных частот по реакции крови на воздействие ММ ЭМИ *in vitro* [13], а также оптимизация длительности воздействия (30-45-60 мин) и количества лечебных процедур в течение одного курса на основании индекса Гаркави-Уколовой-Квакиной [14].

В основе КВЧ-С лежит гипотеза о том, что используемые стандартные частоты ММ ЭМИ оказывают влияние на общие для различных биологических объектов структуры, такие, как белки-ферменты, клеточные мембраны и т.д. Имитируя внутренние сигналы управления, аналогичные вырабатываемым самими клетками при различных условиях жизнедеятельности, лечебное КВЧ-воздействие активизирует имеющиеся резервы и ускоряет адаптационные и восстановительные процессы, направленные на устранение имевшихся нарушений [15].

1.2. [КВЧ-МРТ], где «МРТ» - микроволновая резонансная терапия.

КВЧ-МРТ это вариант КВЧ-терапии с индивидуальным подбором частоты ЭМИ:

а) лечебная частота для каждого пациента подбирается индивидуально на основании анализа сенсорных реакций или изменений динамических параметров организма, регистрируемых с помощью ЭКГ, ЭЭГ, термометрии и т.д. [5-6, 16-18]; наибольшее количество индивидуальных терапевтических частот лежит вблизи линий поглощения ЭМИ молекулярным кислородом [5-6, 16].

б) в качестве зон воздействия используются точки акупунктуры (ТА), выбранные на основании синдромного или нозологического диагноза [5-6, 16].

в) длительность воздействия на одну ТА до 10 минут, а длительность процедуры варьирует в пределах 20-30 минут, лечебный курс состоит из 1-15 процедур [5-6].

В основе метода лежит гипотеза о наличии для каждого биологического объекта и, в частности, для человека, собственных «характеристических частот». Воздействие этими частотами сопровождается резонансным откликом организма и коррекцией нарушенного гомеостаза. Распространение ММ-волн в организме человека и животных происходит по «каналам», описанным в традиционной китайской медицине [16].

1.3. [КВЧ-МВТ], где «МВТ» - молекулярно-волновая терапия.

КВЧ-МВТ это вариант КВЧ-терапии, при которой низкоинтенсивное воздействие осуществляется на «резонансных частотах прозрачности воды»:

а) индивидуальные лечебные частоты, соответствующие резонансным частотам водных структур в норме: 50,3; 51,8; 65,0; 100,0; 130,0; 150,0 ГГц и др., подбираются с помощью спектрально-волновой диагностики [9-10, 19];

б) КВЧ-воздействии осуществляется на кожные проекции внутренних органов;

в) длительность процедуры при различных нозологических формах и синдромах варьирует от 20 до 60 минут;

г) лечебный курс состоит из 8-10-12 процедур.

В основе методики лежит следующая гипотеза: низкоинтенсивные радиоволны, соответствующие резонансным частотам нормальных водных структур, свободно проникают вглубь биоткани; при достижении внутренних органов, внешнее ММ ЭМИ восстанавливает частоты, присущие нормальному состоянию внутренних органов; в результате восстановления нормальных частот происходит коррекция морфофункционального состояния больного органа. Для выбора индивидуальных терапевтических частот используется радиометр (на частоте 1000 ± 50 МГц), регистрирующий отклик биообъекта на воздействие ММ ЭМИ определенной частоты [9, 10].

Сравнивая методики КВЧ-МРТ и КВЧ-МВТ, можно найти следующие различия: при МРТ наибольшее количество индивидуально выбранных терапевтических частот лежит вблизи линий поглощения ЭМИ молекулярным кислородом, а при МВТ, используются «резонансные частоты прозрачности воды»; при МРТ воздействия осуществляется на ТА, а при МВТ – на кожные проекции внутренних органов.

Между тем, в обеих методиках анализируется «резонансный отклик»: при МВТ с помощью радиометра осуществляется регистрация отклика ткани органа, подвергаемого КВЧ-воздействию; при МРТ воздействие осуществляется на точки акупунктуры, а «резонансный отклик» регистрируется в области исходно выявленных нарушений с помощью ЭЭГ, ЭКГ, термометрии и других методов.

1.4. [КВЧ-ИВТ], где «ИВТ» - информационно-волновая терапия.

КВЧ-ИВТ это вариант КВЧ-терапии, при которой используется низкоинтенсивное (0,01-0,8 мкВт) широкополосное шумовое излучение (30-325 ГГц), а воздействие осуществляется на «системные» ТА [5, 7-8]. Курс лечения состоит из 7-10 процедур по 20-25 минут каждая.

КВЧ-ИВТ является одним из вариантов КВЧ-МРТ [5-8]. В основе метода лежит гипотеза о «принципе разумности самонастраивающейся биологической системы», при условии, что она сохраняется как система и не вышла по ряду параметров из зоны регулирования или саморегулирования. Предполагается, что организм больного выбирает из набора частот, наиболее значимые, способные корректировать имеющиеся нарушения. При КВЧ-ИВТ нет необходимости в индивидуальном подборе лечебной частоты, режима тормозного или тонизирующего воздействия и постановки синдромного диагноза для выбора ТА [7-8, 20].

Иногда вместо названия «информационно-волновая терапия» используется термин «миллиметрововолновая терапия» [20].

1.5. [КВЧ-П], где «П» - пунктура.

КВЧ-П это вариант КВЧ-терапии с индивидуальным подбором точек и зон воздействия [11-12]:

а) когерентное, шумовое или комбинированное ММ ЭМИ используется без подбора индивидуальной частоты или диапазона частот;

б) точки или зоны воздействия для каждого пациента выбираются индивидуально на основании синдромного диагноза традиционной китайской медицины;

в) длительность КВЧ-воздействия определяется синдромным диагнозом и ощущениями, возникающими у пациента во время лечебной процедуры: эффект тонизации достигается в течение 2-5 минут, при этом, необходимо дождаться появления первых сенсорных реакций (обычно комфортных), эффект торможения достигается в течение 15-30 минут и требуется дождаться появления, стабилизации и исчезновения сенсорных реакций (обычно дискомфортных); анализируя соотношение частоты пульса и дыхания или температуру в определенных ТА, можно осуществлять динамический контроль в процессе лечения и обеспечивать индивидуализацию длительности КВЧ-воздействия [18, 21].

В основу методики легли выводы о том, что ведущую роль в повышении эффективности КВЧ-терапии играет точка или зона воздействия, выбор которых эффективно решен в рамках теории традиционной китайской медицины. При адекватно выбранной ТА или рефлексогенной зоны необходимость в подборе частоты ММ ЭМИ отпадает [22].

1.6. [КВЧ-Э], где «Э» - эксперимент.

КВЧ-Э это использование КВЧ-воздействия в эксперименте *in vivo* или *in vitro*.

1.7. [КВЧ] – «КВЧ-терапия» - общее название *любой методики* лечебного использования низкоинтенсивного электромагнитного излучения миллиметрового диапазона.

При необходимости можно вводить названия комбинированных методик:

1.8. [КВЧ-МРП], где «МРП» - микроволновая резонансная пунктура.

КВЧ-МРП это вариант КВЧ-терапии с индивидуальным подбором частоты ЭМИ и точки или зоны воздействия (комбинация КВЧ-МРТ и КВЧ-П):

а) лечебная частота подбирается для каждого пациента *индивидуально*;

б) для КВЧ-воздействия используются точки акупунктуры, выбранные на основании *синдромного диагноза* ТКМ.

1.9. [КВЧ-МРР], где «МРР» - микроволновая резонансная рефлексотерапия.

КВЧ-МРР это вариант КВЧ-терапии с *индивидуальным* подбором частоты ЭМИ, а точки акупунктуры выбираются на основании рекомендаций, адаптированных под *нозологический диагноз*.

1.10. [КВЧ-Р], где «Р» - рефлексотерапия.

КВЧ-Р это вариант КВЧ-терапии, при которой используются *стандартные частоты* ММ ЭМИ, а точки акупунктуры, выбираются на основании рекомендаций, адаптированных под *нозологический диагноз*.

1.11. При моно-КВЧ-терапии: можно указывать только [**КВЧ - …**], при комплексной медикаментозной и КВЧ-терапии – указывать [**М + КВЧ** : и далее …], при комплексной лазерной, медикаментозной и КВЧ-терапии – указывать [**лазерная + М + КВЧ** : и далее…]. При необходимости, дополнительно расписывается методика проведения лазерной терапии или других методов физического лечения, а также схема проведения медикаментозной терапии (название медикамента и ежедневные дозы или подробная схема назначения препарата).

2. Используемый аппарат и основные характеристики ЭМИ

2.1. После методики КВЧ-терапии в формуле указывается название используемого аппарата, включая номер модели, например, «Явь-I», «Арцах-03», «Электроника-КВЧ», «Электроника КВЧ-104», «Г4-142», «Стелла-1», «Шлем», «Порог», «Ария», АМРТ и т.д.

2.2. Далее необходимо отразить характеристики излучения: когерентное излучение (КГ) с указанием частоты ЭМИ или длины волны и шумовое излучение (Ш) с указанием диапазона используемых частот или длин волн, а также амплитудную (АМ) или частотную (ЧМ) модуляцию, например:

- **«КГ 60,00 ГГц»** или **«КГ 5,0 мм»** – когерентное излучение с частотой 60 ГГц или на длине волны 5 мм;
- **«Ш 42,00-95,00 ГГц»** или **«Ш 7,14-3,16 мм»** – шумовое излучение в диапазоне частот 42,00 – 95,00 ГГц или в диапазоне длин волн 7,14-3,16 мм;
- **«Кмб: КГ 60,00+Ш 42,00-95,00 ГГц»** или **«Кмб: КГ 5,0 мм+Ш 7,14-3,16 мм»** – комбинированное

излучение, включающее когерентное излучение с частотой 60 ГГц (или длиной волны 5 мм) и шумовое излучение в диапазоне частот 42,00 – 95,00 ГГц (или в диапазоне длин волн 7,14-3,16 мм);

- если единицы измерения даны в гигагерцах или в миллиметрах, то можно их не указывать, например, **«КГ 60,00»** или **«КГ 5,0»**, **«Ш 42,00-95,00»** или **«Ш 7,14-3,16»**, или **«КГ 60,00+Ш 42,00-95,00»** и т.д.;
- **«АМ 00 Гц»** - непрерывное излучение без модуляции, **«АМ 10 Гц»** — амплитудная модуляция с частотой 10 Гц, **«АМ 1-99-1»** — амплитудная модуляция в режиме «волновых качелей» от 1 до 99 Гц и обратно от 99 до 1 Гц, **«ЧМ±50 МГц»** — частотная модуляция в диапазоне 50 МГц от основной частоты и др..

3. Локализация КВЧ-воздействия

В формуле необходимо отразить локализацию воздействия:

- стандартная зона: «затылок», «грудина», «правый/левый плечевой сустав» или «затылок + грудина» и т.д.,
- индивидуально выбранная зона: «зона проекции щитовидной железы», «зона *Захарьина-Геда* Сердца» или «зона *Захарьина-Геда* Желчного пузыря» и др.,
- точки акупунктуры: «ТА: St_{36}, GI_{4}, Rp_{6} …» с указанием названия в скобках [например, St_{36} (*Цзу Сань Ли*)] или без него; воздействие на правую (П), левую (Л) или обе (П+Л) точки акупунктуры, (П/Л) – чередование правой и левой ТА;
- в эксперименте указывается биологический объект, например – «нерв» или животное и локализация воздействия, например – «белые крысы, затылок» или кровь *in vitro* и др.

4. Длительность, режим КВЧ-воздействия, и количество процедур

Общая длительность КВЧ-воздействия указывается в минутах (или «мин.» или значок «'»), например, 30 минут или 30-45 мин. или 60'.

Если в течение одной процедуры используются различные частоты, то в формуле может быть «15+15», тогда это указывает на время использования каждой из двух длин волн (частот), например: «5,6 и 7,1 …: … 15+15» означает, что время воздействие на каждой длине волны, т.е. 5,6 и 7,1 мм продолжается по 15 минут.

Если в течение одной процедуры проводится воздействие на несколько ТА или зон, то указывается длительность воздействия на каждую локализацию, например, «грудина + затылок …: 15+20» означает, что воздействие на грудину продолжалось 15 минут, а воздействие на затылок 20 минут; или «ТА: St_{36}, GI_{4}, Rp_{6} …: 10+20+10…» означает, что проводилось воздействие на точки акупунктуры St_{36}, GI_{4} и Rp_{6} в течение 10, 20 и 10 минут соответственно.

Количество процедур на один курс дается в конце формулы, например, 8-10, что означает, 8-10 процедур на курс.

Если имеются какие-либо дополнительные особенности режима проведения КВЧ-терапии, то они могут указываться отдельно в конце формулы, например «2 раза в неделю» или «при общей экспозиции 30 минут», «20 минут на область грудины», «10 минут на область затылка» и т.д.

Различные параметры формулы разделены двоеточием [:]. Если некоторые обозначения можно опустить, в связи с их очевидностью, то формула приобретает еще более короткое написание, например не указывается «мм» после длины волны, «ГГц» – после частоты ЭМИ, «ЧМ» перед ±50 МГц.

Если какой-либо из параметров неизвестен, то его можно заменять буквой «X» или не указывать. Если какой-либо из параметров в эксперименте меняется, то в формуле его следует указать в виде «N», при этом можно уточнить: «N» раз или «N» мин. и т.д. В этом случае, в *тексте*, при описании эксперимента указывается (N=5) или (N=5 раз) или (N=5) или (N=5 мин).

5. Примеры унифицированного обозначения режима терапии

5.1. Формула [**КВЧ-МВТ : «Малыш-САР» : КГ 65,0 ГГц : ППМ 5 мкВт/см^2 : «щитовидная железа» : 30 мин : 10 раз**] или [**КВЧ-МВТ : «Малыш-САР» : 65,0 : 5 мкВт/см^2 : «щитовидная железа» : 30 : 10**] означает, что проводился курс молекулярно-волновой терапии на частоте 65,0 ГГц; использовался аппарат «Малыш-САР»; режим когерентного немодулированного излучения; плотность потока мощности на частоте 65,0 ГГц составляла 5 мкВт/см^2; воздействие осуществлялось на область проекции щитовидной железы в течение 30 минут; курс состоял из 10 процедур.

5.2. Формула [**М + КВЧ-С : «Явь-I» : КГ 5,6 мм : ППМ 10 мВт/см^2 : ЧМ ± 50 МГц : «грудина» : 30 мин : 10 раз**] или в более сокращенном варианте [**М + КВЧ-С : «Явь-I» : 5,6 : 10 мВт/см^2 : ± 50 МГц : «грудина» : 30 : 10**] означает, что на фоне медикаментозной терапии с помощью аппарата «Явь-I» проводился стандартный вариант КВЧ-терапии; использовалось когерентное модулированное по частоте (±50 МГц) излучение с длиной волны 5,6 мм, плотность потока мощности - 10 мВт/см^2, воздействие осуществлялось на грудину в течение 30 минут, лечебный курс состоял из 10 процедур.

5.3. Формула [**КВЧ-П : «Арцах-01» : Кмб КГ 60,00 ГГц + Ш 42,00 – 95,00 ГГц : ППМ 5 мВт/см^2 + СПМШ 20 dB/kT_0 : АМ 1-99-1 : ТА (П: E_{36}, E_{42}, Rp_4) : 5-15 мин : 8-10 раз**] или [**КВЧ-П : «Арцах-01» : 60,00 + 42,00 – 95,00 : 5 мВт/см^2 + 20 dB/kT_0 : АМ 1-99-1 : ТА (П: E_{36}, E_{42}, Rp_4) : 5-15 : 8-10**] означает, что проводился курс КВЧ-пунктуры; использовался аппарат «Арцах-01»; режим комбинированного (когерентное + шумовое) излучения; плотность потока мощности когерентного излучения на частоте 60,0 ГГц составляла 5 мВт/см^2, спектральная плотность мощности шума в диапазоне 42,0-95,0 ГГц составляла 30 dB/kT_0; использовалась амплитудная модуляция в режиме «волновые качели» в диапазоне частот от 1 до 99 и от 99 до 1 Гц; воздействие осуществлялось справа на точки акупунктуры (E_{36}, E_{42}, Rp_4), которые выбирались на основании синдромного диагноза традиционной китайской медицины; длительность воздействия на ТА была индивидуальна и варьировала от 5 до 15 минут; всего проведено 8-10 процедур.

5.4. Формула [**КВЧ-МРТ : «Г4-142» : КГ 53,85 ГГц : ППМ 5 мкВт/см^2 : ТА (П: E_{36}, Rp_4): 10+15 мин : 10 раз**] или [**КВЧ-МРТ : «Г4-142» : 53,85 : 5 мкВт/см^2 : ТА (П: E_{36}, Rp_4): 10+15 : 10**] означает, что проводился курс микроволновой резонансной терапии с индивидуально выбранной частотой 53,85 ГГц; использовался аппарат «Г4-142»; режим когерентного немодулированного излучения; плотность потока мощности на частоте 53,85 ГГц составляла 5 мкВт/см^2; воздействие осуществлялось справа на ТА E_{36} в течение

10 минут и на ТА Rp$_4$ 15 минут; курс состоял из 10 процедур.

5.5. Формула [**КВЧ-ИВТ : «Порог» : 2-5 ТА : 25-30 мин : 7-10 раз**] или [**КВЧ-ИВТ : «Порог» : 2-5 ТА : 25-30 : 7-10**] означает, что проводился курс информационно-волновой терапии; использовался аппарат «Порог»; режим широкополосного шумового излучения; плотность потока мощности шума не известна; модуляция не использовалась; воздействие осуществлялось на 2-5 системных ТА; курс состоял из 7-10 процедур.

5.6. Формула [**КВЧ-Э : «Явь-I» : КГ 5,6 мм : ППМ 5 мВт/см^2 : «мыши - затылок» : 60 мин : 5 раз**] или [**КВЧ-Э : «Явь-I» : 5,6 : 5 мВт/см^2 : «мыши - затылок» : 60 : 5**] означает, что в эксперименте на мышах использовался аппарат «Явь-I»; при этом когерентное не модулированное КВЧ-воздействие на длине волны 5,6 мм осуществлялось на затылочную область животных; плотность потока мощности - 5 мВт/см^2; курс состоял из 5 процедур по 60 минут каждая.

6. Специальные методики КВЧ-терапии

В литературе встречается описание специальных методик КВЧ-терапии, при которых в течение процедуры или курса меняются некоторые лечебные параметры, а именно, длительность процедуры, частота проведения лечебных сеансов, модуляция ЭМИ, зоны и точки, используемые для КВЧ-воздействия, и т.д.

6.1. Длительность воздействия в течение одного лечебного курса:

- «введение в волну» или «нарастающая – адаптирующая методика», т.е. постепенное увеличение длительности процедуры с целью предупреждения обострения хронического заболевания [23-24], а также в онкологической практике у больных с раковой кахексией, генерализованными формами заболевания и тяжелыми жизнеугрожающими послеоперационными осложнениями [25];
- «выход из волны», т.е. постепенное уменьшение длительности процедуры с целью предупреждения синдрома отмены [23-24];
- «прерывистый режим» - используется у тяжелых больных и представляет собой чередование воздействия и пауз: например, 2 секунды аппарат работает, затем 5 секунд перерыв и т.д. [26]; аналогичная методика применяется при лечении больных туберкулезом под названием «дробный режим» [27].

6.2. Частота проведения процедур в течение одного лечебного курса:

- «щадящий режим» - т.е. постепенное нарастание временного интервала между лечебными процедурами, например, в начале курса ежедневные сеансы, далее – через день; этот режим используется у ослабленных больных с множественной патологией, в пожилом возрасте, а также в связи с эффектом кумуляции, выявляемом с помощью электропунктурной диагностики [28-29].

6.3. Частотная и амплитудная модуляция в течение лечебной процедуры:

- режим «биоуправляемой ММ-терапии», т.е. с целью повышения эффективности лечения применяется биоуправляемая частотная и амплитудная модуляция ММ ЭМИ с изменением частот от 49,6 до 78,9 ГГц и мощности — от 14 до 32 мВт в соответствии с динамикой артериальной и венозной составляющей капиллярного кровотока; КВЧ-воздействие осуществлялось в импульсном режиме в момент прихода пульсовой волны и на высоте вдоха [30].

6.4. Зоны или точки воздействия в течение лечебной процедуры:

– «сканирующее» КВЧ-воздействие - метод заключается в сканировании луча ММ ЭМИ по определенной траектории: данная методика описана при лечении эпилепсии у домашних животных [31].
– «многоканальная КВЧ-терапия», т.е. одновременное воздействие на несколько точек акупунктуры [21, 32, 33].

6.5. Прочие варианты специальных методик:

В одной из работ встречается «режим биорезонанса», но, к сожалению, нет объяснения методики использования данного режима [34]. Описана также возможность лечебного применения воды или жидкостей, обработанных с помощью ММ ЭМИ [35-36].

Таким образом, использование одного из стандартных режимов не требует дополнительных пояснений, так как унифицированная формула проведения КВЧ-терапии уже содержит основные параметры лечебного воздействия.

Специальные режимы КВЧ-терапии, вошедшие в регулярную медицинскую практику, можно обозначать по их названию, например, «введение в волну», «выход из волны», «прерывистый режим» и т.д., в других случаях необходимо давать их подробное описание.

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Standard description of EHF-therapy methods

M.Teppone, R.Avakian

With the purpose of standardization of the description of extremely high frequency (EHF) - therapy the unified formula in which the name of the method is entered, the used device, the basic characteristics of electromagnetic radiation, localization of influence and other parameters of carrying out of medical procedure is offered. Besides there is a short description of standard and special variants of EHF-therapy.

Крайне высокочастотная (КВЧ)-терапия в онкологии

Обзор

Теппоне М.В., Авакян Р.С.

ООО «Колояро-2000»

В статье представлен обзор литературы, посвященной применению низко интенсивного электромагнитного излучения миллиметрового диапазона в экспериментальной и клинической онкологии.

1. ММ ЭМИ в экспериментальной онкологии

В эксперименте по изучению биологических эффектов электромагнитного излучения было выявлено, что предварительное облучение животных электромагнитным излучением (ЭМИ) сантиметрового диапазона в несколько раз снижало смертность от последующего ионизирующего излучения, предъявляемого в летальной дозе [1, 2].

В последующем, аналогичный эффект был доказан для миллиметрового (ММ) диапазона ЭМИ. Биологические эффекты ММ ЭМИ зависели от длины волны, используемой мощности и длительности облучения [3-5].

Дальнейшие экспериментальные и клинические исследования велись по нескольким направлениям, а именно, влияние ММ ЭМИ на опухолевый рост, гемопротекторный эффект ММ ЭМИ и сочетанное использование ММ ЭМИ с традиционно принятыми методами радикального лечения опухолей.

Получены следующие результаты.

1) ММ ЭМИ не ускоряя опухолевого роста, оказывает ингибирующее влияние на развитие трансплантируемой саркомы и увеличивает срок жизни экспериментальных животных. Эффект максимального подавления роста опухоли (до 60 %) наблюдается при использовании ММ ЭМИ как до, так и после ее трансплантации [6-9].

Выявлены различия эффектов подавления опухолевого роста в зависимости от вида прививаемой опухоли, места прививки опухоли, места КВЧ-воздействия (по отношению к месту имплантации опухоли) и количества лечебных процедур. У животных, которым опухоль перевивалась в область точки акупунктуры (ТА) GI$_4$ (*Хэ Гу*)[1] на одной лапке, а КВЧ-воздействие проводилось на область ТА GI$_4$ (*Хэ Гу*) на противоположной лапке, отмечено значительное торможение опухолевого роста, причем, более выраженное при 3-х кратном воздействии, чем при однократном [9].

В эксперименте на мышах продемонстрировано достоверное снижение скорости развития опухоли на 40-60 % при предварительном облучении у них точек E$_{36}$ (*Цзу Сань Ли*) и GI$_4$ (*Хэ Гу*) [10]. Изолированное использование стандартного режима КВЧ-воздействия [аппарат «Явь-I»: длина волны – 7,1 и 5,6 мм: плотность потока мощности - 10 мВт/см^2, длительность процедуры - 30 минут, количество процедур – 7], а также сочетание КВЧ-излучения с эндоксаном позволили добиться торможения роста карциномы легкого *Льюиса* (*LLC*) у мышей, снизить ее метастатическую активность и увеличить продолжительность жизни экспериментальных животных на 58 % [11].

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[1] в статье используется французская номенклатура названия каналов

2) В сочетании с противоопухолевыми препаратами (винкристин, имифос, циклофосфан, эндоксан и др.) или рентгеновским облучением ММ ЭМИ избирательно действует на кроветворную систему. Причем характер воздействия определялся последовательностью применения различных факторов. Гемопротекторный эффект и повышение выживаемости экспериментальных животных наблюдались лишь в тех случаях, когда воздействие ММ ЭМИ предшествовало ионизирующему облучению. Если же облучение ММ ЭМИ следовало за ионизирующим излучением, то наблюдалось потенцирование повреждающего эффекта последнего [3, 6].

В последующих экспериментах на мышах было также подтверждено, что ММ-воздействие (частота - 42,19 ГГц, излучение когерентное или с частотной модуляцией ±150 МГц, плотность потока мощности - 15-17 мВт/см^2, длительность воздействия 25 мин.) повышает или снижает резистентность животных к воздействию γ-излучения (в дозе – 6,5 Грей). Знак эффекта определялся последовательностью применения этих факторов. В тех случаях, когда воздействие ММ ЭМИ (в течение 20 дней) предшествовало ионизирующему облучению, отмечена задержка развития лучевой болезни и снижалась смертность животных в 1,5-2 раза по сравнению с контролем. Если же облучение ММ ЭМИ (в течение 30 дней) следовало за ионизирующим излучением, то наблюдалось потенцирование повреждающего эффекта последнего и смертность, по сравнению с изолированным γ-излучением, увеличивалась в 1,3 раза. Если животные подвергались воздействию ММ ЭМИ как до γ-излучения (в течение 5 дней), так и после (в течение 30 дней), то протекторный эффект сохранялся, но был выше при использовании модулированного КВЧ-излучения, по сравнению с когерентным [12].

Однако, на культуре клеток нормальных фибробластов человека, растущих *in vitro*, выявлено, что небольшие дозы (по времени) КВЧ-воздействия обладают умеренным протекторным действием, даже при их использовании после ионизирующего излучения [13].

4) На модели гипопластического костного мозга выявлено повышение пролиферации костного мозга доноров, предварительно облученных ММ ЭМИ. Выживаемость животных после облучения летальной дозой рентгена достигала 95-98 %. Отмечено значительное снижение клинических проявлений костномозгового синдрома [14-15].

5) На мышах сравнивали эффективность противоопухолевого воздействия монохроматического и модулированного по частоте (псевдогаусовым шумом) КВЧ-облучения [частота – 42,22 ГГц, плотность потока мощности – 1-5 мВт/см^2, на область затылка]. При воздействии модулированного ЭМИ наблюдается частичная регрессия опухоли, при воздействии когерентным - такого эффекта отмечено не было. Показано, что при идентичной мощности, меняя ширину окна и центральную частоту модуляции, можно оказывать на опухолевый процесс выраженное разнонаправленное влияние: от регрессии опухоли и увеличения средней продолжительности жизни животных (ширина окна – 10 Гц и центральная частота модуляции – 10 Гц), до стимуляции роста и сокращении сроков жизни (ширина окна – 1 кГц и центральная частота модуляции – 1 кГц) [16-17].

6) Эксперименты на крысах продемонстрировали многогранный эффект низкоэнергетического импульсного КВЧ- и СВЧ-воздействия наносекундной длительности с большой пиковой мощностью. «Новый» режим воздействия не оказывал отрицательного влияния на экспериментальных животных, активизировал

защитные противоопухолевые системы организма, оказывал непосредственное влияние на клетки карциносаркомы *Уокера in vitro*, сдерживал индуцированный канцерогенами опухолевый рост, снижал вероятность метастатического поражения и повышал сроки жизни экспериментальных животных на 25-30 % [18-19].

7) КВЧ-волны способствуют локальной нормализации показателей перикисного окисления липидов (ПОЛ) и антиоксидантной системы организма. В контрольной группе крыс-опухоленосителей обнаруживалось повышение содержания малонового диальдегида в печени (518,0±15,7 нм/мг). После КВЧ-воздействия этот показатель значительно снижался (394,0±20,3 нм/мг), отражая положительный эффект лечения. Обратная динамика наблюдалась в опухолевой ткани, где под влиянием ММ ЭМИ имело место повышение аскорбатзависимого ПОЛ (опыт — 261,2±10,8 нм/мг, в контроле — 178,9±9,6 нм/мг). Это связано с накоплением цитотоксических свободных радикалов и, по-видимому, способствует ускоренной гибели опухолевой клетки [7-8].

Таким образом, ММ ЭМИ не ускоряет опухолевый рост, не снижает эффективности стандартной схемы лечения, обеспечивает гемопротекторный эффект при сочетании с химио- и лучевой терапией и продлевает сроки жизни экспериментальных животных. Наилучший противоопухолевый и антиметастатический эффекты были достигнуты при сочетанном применении КВЧ- и медикаментозной химиотерапии.

2. КВЧ-терапия в клинической онкологии

Клинические испытания КВЧ-терапии показали, что ММ ЭМИ не стимулирует опухолевый рост как первичного, так и метастатического очага и даже способствует уменьшению размеров опухоли [8, 20-25].

Самостоятельно КВЧ-терапия может применяться для лечения доброкачественных опухолей или в качестве паллиативного воздействия с целью снижения выраженности болевого и токсического синдромов. Во всех остальных случаях КВЧ-терапию целесообразно сочетать с оперативным лечением или с химио- и лучевой терапией.

К настоящему времени в онкологической практике КВЧ-терапия используется для лечения следующих нозологических форм и синдромов: полипы желудка и миома матки, доброкачественные опухоли кожи и яичников, локализованный фиброаденоматоз и фиброаденомы грудной железы, злокачественная меланома кожи, рак желудка, молочной железы, яичников, тела и шейки матки, пищевода, легкого, толстого кишечника, ЛОР-органов и др. [22-35].

2.1. В предоперационный период применение ММ ЭМИ позволяет купировать некоторые сопутствующие заболевания, включая эрозивно-язвенные поражение слизистой оболочки желудка и двенадцатиперстной кишки, обострение хронических заболеваний органов дыхания, пищеварения, мочеполовой системы и др., что расширяет возможности оперативного лечения.

Применение КВЧ-терапии до и после операции обеспечивает снижение таких послеоперационных осложнений, как гнойно-септические состояния, геморрагический и атонический синдромы, а также ускоряет процесс заживления ран и постэксцизионных дефектов [25].

Уменьшается выраженность или полностью устраняется болевой синдром, что позволяет снизить дозу анальгетических и наркотических препаратов. В ряде случаев удается предотвратить развитие метастазов [10, 22, 24-25, 30-31, 34, 36].

2.2. Необходимо отдельно подчеркнуть влияние КВЧ-терапии на течение после-операционного раневого процесса.

На стадии альтерации уменьшается интенсивность некролиза и перифокальных реакций. Достаточно быстро исчезает отек и гиперемия, не наблюдается осложнений в виде прорезывания швов.

На стадии регенерации грануляционная ткань никогда не выходит за пределы раны, эпителизация начинается быстрее, чем в контроле, причем равномерно с краев. Рубец никогда не бывает плотным и не бывает келлоидизации, что дает прекрасный косметический эффект.

Полное заживление раны происходит на 5-6 дней раньше, чем при обычном течение раневого процесса [23, 32].

При лечении лазерных ран, у больных отсутствуют побочные реакции, быстро исчезает боль и ощущение дискомфорта в ране [23].

2.3. В клинической онкологии КВЧ-терапия получила наиболее широкое распространение в качестве гемопротекторного и гемостимулирующего фактора при проведении химио- и лучевой терапии.

2.3.1. У больных с исходно сниженным уровнем лейкоцитов периферической крови, ММ ЭМИ может повысить его до уровня, позволяющего назначить курс химиотерапии [7, 9, 23, 36-37]. Не подавляя противоопухолевой активности химиопрепаратов (5-фторурацил, циклофосфан, метатрексат), ММ ЭМИ значительно уменьшает выраженность их токсического действия (тошнота, рвота, расстройства кишечника, снижение веса тела и др.), что обеспечивает проведение лечения в полном объеме без изменения сроков и режима химиотерапии. Количество лейкоцитов в периферической крови остается в пределах нормы [21-25, 32, 37-39].

Стимуляция лейкопоэза и купирование токсического действия химиопрепаратов у онкологических больных было более эффективным на длине волны 7,1 мм, чем 5,6 мм (аппарат «Явь-I», длина волны – 7,1 и 5,6 мм, на область грудины, длительность – 60 мин) [37].

2.3.2. Профилактическое назначение КВЧ-терапии обеспечивало предупреждение развития токсических реакций (в 60 % случаев) или уменьшало их выраженность при проведении специфической химиотерапии платидианом [24-25].

2.3.3. Изучение функциональной активности сегментоядерных нейтрофилов крови выявило достоверное снижение процента ореолообразующих клеток по сравнению с исходным уровнем (до лечения — 3.42±0,21 %, после лечения — 2.06±0,26 %), что указывает на повышение активности сегментоядерных нейтрофилов и, возможно, объясняет снижение побочных токсических явлений, наблюдавшихся у больных при химиотерапии [39].

2.3.4. Аналогичные результаты достигаются при использовании ММ ЭМИ с лучевой терапией.

Сочетание КВЧ-излучения и низкоинтенсивного лазера (680 *нм*) реализует не только гемопротекторный эффект, но позволяет уменьшить выраженность и купировать такие проявления лучевого воздействия, как лучевой фиброз (в 67,1 % случаев), хондро-перихондрит (90,7 %), ректит (91,2 %), стоматит (96,3 %), цистит (96,4 %), вагинит (100 %), энтероколит (100 %) и эпидермит (100%) и др., что позволяет провести полный курс комбинированной терапии, улучшить его результаты и сократить продолжительность лечения с 18,0±4,0 до 6,5±1,5 дней [24-25].

Ощее и местное КВЧ-воздей-ствие («Явь-I», 5,6 мм) при наличии лучевых повреждений в виде эндометрита, индурации подкожной клетчатки, лимфостаза, свищей, трофических язв и др., сопровождалось эпителизацией кожи, уменьшением отека и боли, а также улучшением показателей периферической крови через 6-8-10 сеансов [40].

2.4. Использование КВЧ-терапии у онкологических больных позволяет уменьшить выраженность или полностью устранить различные звенья патогенеза основного заболевания.

2.4.1. Одним из важных компонентов клинического проявления опухоли любой локализации является наличие болевого синдрома, нарастающего по мере прогрессирования заболевания. Большинство пациентов нуждаются в медикаментозной терапии, включающей наркотические или ненаркотические анальгетики. Назначение КВЧ-терапии позволяет уменьшить выраженность или полностью купировать болевой синдром, а следовательно, снизить дозу применяемого препарата. Обезболивающий эффект начинает проявляться во время сеанса лечения и может продолжаться сутки и более. Относительно стойкий эффект обезболивания наступает через 2-3 процедуры лечения [7, 10, 22, 39].

При использовании МРТ[2] обезболивающий эффект в различной степени достигнут у 95 % онкологических больных. Рекомендуются следующие точки акупунктуры: при гинекологической патологии — TM_{20} (*Бай Хуэй*), Rp_6 (*Сань Инь Цзяо*), JM_1 (*Хуэй Инь*), V_{30} (*Бай Хуань Шу*) и V_{27} (*Сяо Чан Шу*); при легочной патологии — JM_{15} (*Цзю Вэй*), JM_{22} (*Тянь Ту*), V_{15} (*Синь Шу*), GI_{10} (*Шоу Сань Ли*) и VB_{37} (*Гуан Мин*); при урологической патологии — F_2 (*Син Цзянь*), R_{12} (*Чжун Вань*), C_2 (*Цин Лин*), Rp_6 (*Сань Инь Цзяо*) и V_{25} (*Да Чан Шу*); при заболеваниях желудочно-кишечного тракта — P_7 (*Ле Цюе*), MC_6 (*Нэй Гуань*), GI_9 (*Шан Лянь*), JM_8 (*Шэнь Цюе*) и TR_5 (*Вай Гуань*) [8-9, 36].

2.4.2. У большинства больных с опухолевыми процессами, и в частности, у больных раком шейки матки, Т-клеточный иммунодефицит проявляется в снижении общего числа Т-лимфоцитов и отдельных субпопуляций. После проведенного курса КВЧ-терапии отмечена тенденция к нормализации этих показателей: Т-лимфоциты (до лечения: 40,0 ± 3,1 %, после лечения: 47,2 ± 3,4 %); Т-активные лимфоциты (до 23,0 ± 2,1 %, после 28,5 ± 1,8 %), Т-хэлперы (до 27,2 ± 1,8 %, после 31,0 ± 3,6 %), Т-супрессоры (до 13,1 ± 1,1 %, после 16,0 ± 2,0 %). Если же основные параметры клеточного иммунитета находились в пределах нормы, то достоверных изменений после КВЧ-воздействия выявлено не было: Т-лимфоциты (до 58,0 ± 3,6 %, после 58,5 ± 3,9 %); Т-активные лимфоциты (до 28,5 ± 2,2 %, после 29,5 ± 2,3 %), Т-хэлперы (до 37,5 ± 2,9 %, после 38,5 ± 3,4 %), Т-супрессоры (до 19,5 ± 1,3 %, после 20,0 ± 1,7 %) [8, 10, 41].

2.4.3. Применение КВЧ-терапии у больных раком шейки матки выявило эффект стимуляции неспецифического гуморального иммунитета, проявляющийся в повышении уровня интерферона. В зависимости от стадии заболевания, нарушение продукции интерферона наблюдалось в 25-40 % случаев. Больным был проведен курс КВЧ-терапии с индивидуальным подбором частоты (т.е. МРТ). Использовались точки акупунктуры: GI_4 (*Хэ Гу*), GI_6 (*Пянь Ли*), Rp_9 (*Инь Лин Цюань*), Rp_8 (*Ди Цзи*), F_3 (*Тай Чун*), VB_{38} (*Ян Фу*) и C_3 (*Шао Хай*).

В среднем, у больных с II-й и III-й стадиями заболевания, способность мононуклеаров продуцировать γ-интерферон повышалась с 20-40 до 95 ед/мл, а при I-й стадии интерферонновый статус возвращался к норме (120 ед/мл). При неизмененном уровне интерферона, каких-либо достоверных изменений после воздействия ММ ЭМИ выявлено не было [8, 10, 36, 41, 42].

2.4.4. Одним из противопоказаний к назначению лучевой и химиотерапии является низкий уровень лейкоцитов периферической крови, наблюдаемый у онкологических больных.

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[2] МРТ- микроволновая резонансная терапия или КВЧ-терапия с индивидуальным подбором частоты ЭМИ.

Для стимуляции лейкопоэза применялась КВЧ-терапия на фиксированных длинах волн (5,6 и 7,1 мм) и КВЧ-терапия с индивидуальным подбором частоты ММ ЭМИ (МРТ). При первом варианте лечения облучались зоны области грудины, затылка или решетчатого лабиринта, при втором — точки акупунктуры: R_7 (*Фу Лю*), P_{10} (*Юй Цзи*), IG_6 (*Ян Лао*), JM_{12} (*Чжун Вань*), JM_{17} (*Тань Чжун*), R_{10} (*Инь Гу*), VB_{35} (*Ян Цзяо*) и VB_{39} (*Сюань Чжун*).

В обоих случаях отмечен выраженный гемостимулирующий эффект, проявляющийся в повышении или нормализации уровня лейкоцитов и других показателей периферической крови, что позволило провести необходимый курс химио- или лучевой терапии [10, 21, 22, 36-37, 41, 43].

2.4.5. Использование КВЧ-терапии сопровождается стимуляцией неспецифических адаптационных возможностей организма больного. Отмечено снижение количества больных с реакцией «стресс» с 12,0 до 3,7 % и увеличение количества больных с переходом реакции «стресс» в реакцию «тренировки» и «спокойной адаптациии» по Л.Гаркави [22, 32].

Динамическое изучение стрессорных и адаптагенных гормонов до и после МРТ выявило снижение исходно повышенной концентрации АКТГ, кортизона и адреналина и повышение исходно сниженной концентрации секретина (от 7,19 ± 2,40 до 41,11 ± 15,9 пг/мл) [8].

2.4.7. Использование КВЧ-терапии позволяет уменьшить токсическое действие химиопрепаратов на различные органы и системы, в частности на сердечно-сосудистую систему.

Под наблюдением находились пациенты (n=12) с диагнозом рак молочной железы клинические гр. II-IV, проходившие курс плановой химиотерапии. Двое не подлежали оперативному лечению в связи с обширным метастазированием, остальные были в послеоперационном периоде с различными сроками операции. Пациенты предъявляли жалобы на боли в области сердца, усилившиеся после введения противоопухолевых препаратов. У пациентов имела место синусовая тахикардия (до 115 уд.мин.) и гипокинетический вариант гемодинамики с высокими цифрами общего периферического сопротивления (ОПС) и снижением ударного и минутного объема крови (УОК и МОК, соответственно). После первого сеанса ИВТ[3] по стандартной схеме больные отмечали ослабление неприятных ощущений в области сердца, уменьшилось ощущение сдавления за грудиной, наступила общая релаксация и уменьшились симптомы интоксикации, вызванные введением химиопрепаратов: тошнота и рвота прекратились в течение 1-х суток. Через 3 дня после начала курса лечения уменьшилась синусовая тахикардия (до 80-95 уд.мин.) и произошли изменения в центральной гемодинамики: уменьшилось ОПС и увеличились УОК и МОК (на 15-20 и 90-145 мл соответственно) [43].

2.5. Профилактическая КВЧ-терапия в онкологии.

Изучение отдельных звеньев патогенеза опухолевого процесса позволяет назначить КВЧ-терапию с профилактической целью для уменьшения риска развития онкологических заболеваний.

2.5.1. Опухолевые клетки вырабатывают медиаторы, способствующие повышению свертываемости крови и уменьшающие ее фибринолитическую активность.

После проведения курса микроволновой резонансной терапии выявлено достоверное снижение свертывающей активности крови на 30 %, включая такие компоненты коагуляции, как общий фибриноген, фибриноген В, протромбин, время свертывания и агрегационная способность тромбоцитов [10].

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[3] ИВТ – информационно-волновая терапия – один из вариантов КВЧ-терапии, при которой воздействие осуществляется широкополосным модулированным сигналом на «общесистемные» ТА.

2.5.2. Как уже отмечалось выше, у больных с различной опухолевой патологией выявляется подавление как клеточного, так и гуморального звена иммунной системы.

Профилактическое назначение МРТ восстанавливает способность мононуклеаров секретировать γ-интерферон, что способствует снижению вероятности развития рака у пациентов, находящихся в группе риска [10]. Среди 360 обследованных у 102 больных были выявлены различные формы «предраковых заболеваний». Ретроспективный анализ показал, что за 3 года, прошедшие после профилактического курса КВЧ-терапии, ни в одном случае не наблюдалось перехода предопухолевой патологии в рак или другие формы злокачественных новообразований [9].

2.5.3. Согласно гипотезе Р.Кабисова в ложе удаленной или облученной опухоли формируется особое состояние тканей, называемое «вторичный предрак»: возможное наличие опухолевых клеток, открытые пути диссеменации, воспалительная реакция тканей, повышенная пролиферативная активность клеток, нарушение системных и локальных механизмов тканевой трофики, изменения межклеточного взаимодействия. Своевременное и эффективное лечение этого состояния обеспечивает противорецидивный и противометастатический эффект и улучшает отдаленный прогноз у онкологических больных. Эффективность использования ММ-волн в послеоперационном периоде с целью профилактики и лечения «вторичного предрака» достигает 76,9 % [25].

2.6. Использование ММ ЭМИ у инкурабельных больных.

При назначении КВЧ-терапии у инкурабельных больных перед медиками стоят следующие задачи:

1) повышение «комфортности оставшейся жизни» за счет обезболивающего, нарко-седативного, детоксикационного, психотерапевтического и других эффектов;

2) продление жизни за счет повышения специфической (антиопухолевой) и неспецифической резистентности организма больного: стимуляция клеточного и гуморального звеньев иммунитета, лечение и предупреждение развития осложнений и сопутствующих заболеваний;

3) перевод онкологического больного из «инкурабельной» группы в группу больных, которым уже можно провести курс комбинированного лечения, включая радикальное, и т.д.

2.6.1. Несмотря на неблагоприятный исход, тем не менее, заслуживает внимание разбор результатов КВЧ-терапии запущенных форм рака (III-IV клинические группы).

Под наблюдением находилось 36 человек, имевших злокачественные опухоли различной локализации. Некоторые из них перенесли паллиативную операцию, химио- или лучевую терапию. Всем больным проведены однократный или повторные курсы КВЧ-терапии с индивидуальным подбором частоты ММ ЭМИ (т.е. МРТ).

Результаты лечения оценивались по срокам выживания со дня проведения первой лечебной процедуры.

(1) К началу лечения состояние больных, умерших в течение месяца ($n = 4$), было крайне тяжелым с выраженным болевым синдромом: обтурационная кишечная опухоль в области сигмостомы; опухоль средостения с прорастанием в трахею, бронхи, крупные сосуды и грудину; рак желудка IV стадии с наличием раковой кахексии и асцита; рак поджелудочной железы с обширными прорастаниями в органы и ткани, с множественными отдаленными метастазами. В результате МРТ наблюдалось улучшение общего состояния, быстрое купирование (частичное или

полное) болевого синдрома, восстановление аппетита и сна.

(2) В группе больных, умерших в сроки от 1 до 6 месяцев (n = 10), имелась следующая локализация рака: поджелудочная железа, печень, язык, пищевод, легкие, толстый кишечник и забрюшинное пространство. Все больные отмечали устойчивый обезболивающий эффект, что позволило отказаться от медикаментозных препаратов. Отсутствовали признаки распада опухоли. Кроме того, произошло уменьшение выраженности или полное купирование таких трудно переносимых проявлений основного заболевания, как одышка, изнурительный кашель и кровохарканье (рак легкого с обтурацией главного бронха), поперхивание и нарушение проглатывания (рак языка и пищевода) и др.

(3) В группе больных, проживших от шести месяцев до одного года (n = 5), результаты лечения были аналогичны описываемым выше.

(4) В следующую группу вошли пациенты, находящиеся под наблюдением и продолжающие получать КВЧ-терапию в течение 4 месяцев (n=6), 12 месяцев (n=5) и 3 лет (n=6). У них были следующие нозологические формы и синдромы: рак грудной и поджелудочной железы, рак мочевого пузыря, простаты, сигмовидной кишки, легкого, забрюшинного пространства и др. В этой группе заслуживают особого внимания выраженность обезболивающего эффекта и отсутствие признаков прогрессирования основного заболевания [44].

2.6.2. Аналогичные исследования по лечению больных IV клинической группы с диагнозом рак желудка или толстого кишечника проведены другими авторами.

Под наблюдением находилось 50 человек [$T_3N_1M_1$ (n = 21), $T_4N_1M_1$ (n = 19) и $T_4N_1M_0$ (n = 10)], имевших следующие варианты гистоморфологического диагноза: недифференцированный рак, слизистый рак, плоскоклеточный рак, перстневидноклеточный рак, недифференцированная аденокарцинома, низкодифференцированная аденокарцинома, умеренно дифференцированная аденокарцинома и злокачественный карциноид.

В группе больных, получавших КВЧ-терапию, во время или непосредственно после сеанса были достигнуты следующие субъективные результаты лечения: боль начинала уменьшаться как по распространенности, так и по интенсивности уже через 10-15 минут от начала сеанса, полное исчезновение болевого синдрома наступало через 30-40 минут; при раке желудка со стенозированием — уменьшилась тянущая боль в области пищевода и в горле, а к концу сеанса появлялся аппетит; кроме того, у всех больных уменьшилась слабость и улучшилось настроение.

Непосредственно после сеанса КВЧ-терапии произошло достоверное увеличение уровня гемоглобина, абсолютного числа эритроцитов и лейкоцитов, а также повысилось процентное содержание лимфоцитов и снизилось процентное содержание сегментоядерных нейтрофилов. Через час после КВЧ-воздействия повышался уровень тиротропина и трийодтиронина до нормальных величин (от 0,87 ± 0,09 до 1,57 ± 0,12 мед/л и 0,45 ± 0,067 до 1,10 ± 0,14 нмоль/л соответственно).

При дальнейшем наблюдении (12-13 дней) анальгетический эффект сохранялся или нарастал, улучшился сон, нормализовался аппетит, уменьшилась слабость и диспепсические явления. При стенозе желудка улучшилась проходимость пищи. Число лейкоцитов и величина гемоглобина постепенно возвращались к исходным значениям, однако нарастал митотический индекс лимфоцитов в среднем от 2,1 ± 0,24 до 10,5 ± 0,67. Масса тела увеличилась на 720 ± 103 г.

Через две недели после завершения курса КВЧ-терапии самочувствие больных вновь ухудшалось за счет появления исходной симптоматики заболевания, хотя и менее выраженной.

Для поддержания постоянного лечебного эффекта рекомендовано проводить курсы КВЧ-терапии каждые две недели в сочетании с поливитаминами, аминокислотами, трийодтиронином (50 мкг ежедневно) и гемотрансфузией по показаниям.

Комплексное лечение больных раком желудка и толстого кишечника в течение нескольких месяцев сопровождалось редукцией опухоли в 25 %, стабилизацией — в 50 % и прогрессированием в — в 25 % случаев.

В контрольной группе больных, получавших лишь симптоматическое лечение (n =20), отмечалась прогрессия опухолевого процесса с нарастанием потребности в анальгезирующих препаратах [45].

В результате проведенных исследований можно сделать следующие обнадеживающие выводы:

- В процессе лечения и в ближайшие 1-3 недели положительная клиническая динамика на симптоматическом и патогенетическом уровне отмечена у большинства больных. Существенное повышение «качества жизни» отмечено в 82 % случаев;
- КВЧ/МР-терапия позволяет купировать ведущие клинические симптомы у онкологических больных и по эффективности не уступает традиционному в таких случаях медикаментозному лечению;
- У некоторых больных возможно достижение стабилизации или редукции опухолевого процесса и перехода инкурабильной формы в курабильную;
- Вероятно, в ходе проводимого лечения злокачественная опухоль теряет некоторые аспекты своей «злокачественности», а именно способность к метастазированию и инвазивному росту [44-45].

3. КВЧ-терапия в лечении доброкачественных опухолей

При лечении полипов желудка и миомы матки использовалась как моно КВЧ-терапия, так комбинированное лечение в сочетании с оперативным вмешательством. При доброкачественных опухолях яичников КВЧ-терапию применяли в послеоперационном периоде.

3.1. КВЧ-терапия больных с полипами желудка.

В зависимости от используемых методик лечения, всех пациентов, получавших КВЧ-терапию по поводу полипов желудка, можно разделить на три группы.

В первой группе проводилась микроволновая резонансная терапия, то есть осуществлялся индивидуальный подбор частоты ЭМИ (аппарат «Г4-142»), а воздействию подвергались точки акупунктуры, обладавшие наименьшим электрическим сопротивлением: JM_{12} (*Чжун Вань*), E_{21} (*Лян Мэнь*), E_{36} (*Цзу Сань Ли*), Rp_4 (*Гунь Сунь*), JM_{10} (*Ся Вань*), V_{20} (*Пи Шу*) и др.). Курс лечения состоял из 8-12 процедур, проводившихся ежедневно или через день. Последующее двухлетнее наблюдение показало улучшение состояния слизистой оболочки желудка, прекращение роста имевшихся полипов и отсутствие возникновения новых [8, 34, 36];

Во второй группе, состоявшей из 13 человек, пациенты получали КВЧ-пунктуру[4]. Точки воздействия подбирались индивидуально на основании синдромного диагноза традиционной китайской медицины: E_{36} (*Цзу Сань Ли*), Rp_3 (*Тай Бай*), Rp_4 (*Гунь Сунь*) и B_{20} (*Пи Шу*). Использовалась частота ЭМИ 53,53 ГГц (аппарат «Г4-142»). Процедуры проводились 1-2 раза в неделю в течение 3-4 месяцев. Через 2-3 недели лечения у 12 человек произошло уменьшение выраженности или полное купирование диспепсического синдрома. В конце курса полное исчезновение одного и более полипов отмечено у 5 человек, уменьшение линейных размеров полипов более чем наполовину - у 4, и уменьшение на 1/3 - у 3. Только в одном случае, где не было субъективного улучшения, динамики размера полипов выявлено не было [35].

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[4] КВЧ-пунктура – вариант КВЧ-терапии, при которой осуществляется индивидуальный выбор точек акупунктуры на основе синдромного диагноза традиционной китайской медицины.

В третьей группе больные получали курс МРТ после эндоскопической электроэксцизии полипов. Купирование послеоперационного болевого синдрома наблюдалось после первых процедур МРТ. Отмечено улучшение функционального состояния слизистой оболочки желудка и ускоренное восстановление обычно замедленной моторной функции желудка. Полная эпителизация постэксцизионных дефектов через 2 недели лечения выявлена более чем у 90 % больных [8, 31, 34, 36].

Таким образом, вышеуказанные работы демонстрируют возможность эффективного использования КВЧ-терапии у больных с полипами желудка не только в качестве одного из компонентов комбинированного лечения, но и как самостоятельный метод лечения, позволяющий достичь клинического и эндоскопического улучшения.

3.2. КВЧ-терапия больных с миомой матки.

Использовались генераторы ММ ЭМИ «Явь-I» с длиной волны 7,1 мм. Воздействию подвергалась область грудины на уровне 2-го ребра. В зависимости от исходных размеров увеличенной матки применялось консервативное или оперативное лечение. Если размеры матки не превышали 10 недель беременности, КВЧ-терапия использовалась в качестве монотерапии или на фоне гормонального препарата «норколут». При размерах матки более 10 недель беременности, КВЧ-терапия назначалась в послеоперационный период.

3.2.1. *Консервативное лечение миомы матки*

Процедуры проводились ежедневно с 10-го по 22-й день менструального цикла. Курс лечения состоял из 10 процедур по 45 минут каждая. Достигнуты следующие результаты лечения: помимо улучшения общего самочувствия, психоэмоционального состояния и нормализации сна, больные отмечали снижение интенсивности болевого синдрома и укорочение продолжительности менструаций в среднем на 1 сутки; контрольное ультразвуковое исследование выявило уменьшение размеров миоматозных узлов в среднем на 4,88 ± 1,54 мм, а в отдельных случаях до 1,5 - 2,0 см; показатели иммунной системы, в частности *T*- хелперы, имели тенденцию к нормализации. Применение КВЧ-терапии на фоне гормонального препарата «норколут» позволило снизить дозу лекарства вдвое без снижения его эффективности [27, 46].

Схожие результаты были получены другими авторами при использовании КВЧ-терапии у больных с миомой матки [аппарат «Явь-I», длина волны – 7,1 мм, на область грудины, в течение 30 минут, 10 процедур]. Полное рассасывание фибромиомы наблюдались в группе женщин, имевших размеры матки до 7 недель беременности. При более крупных размерах матки, положительный результат был менее выражен [48].

У больных с миомой матки и мастопатией КВЧ-терапия [аппарат «Стелла-I», длина волны – 7,1 мм, воздействие интравагинально на область шейки матки] проводилась в сочетании с магнитотерапией на область матки, антибактериальной терапией и массажем головы и воротниковой зоны. В результате лечения наступила нормализация менструального цикла, достоверное ($p<0,05$) уменьшение размеров матки (по результатам объективного осмотра с 7,6 ± 1,7 недель до 6,8 ± 1,6 и по УЗИ с 86,0 ± 1,7 до 67,5 ± 1,6 мм по длине), достоверное ($p<0,05$) уменьшение среднего диаметра миоматозных узлов с 23,8 ± 1,4 до 18,9 ± 1,2 мм, а также улучшение результатов гистологического обследования [49].

В другом исследовании комплексное лечение включало радоновые ванны, КВЧ-терапию, магнитотерапию, ручной массаж волосистой части головы и воротниковой зоны. При наличии вагинальной инфекции проводился курс антибактериальной терапии в сочетании с симптоматическими средствами по стандартной схеме в зависимости от выявленного возбудителя. Результаты лечения: размер матки уменьшился с 7,2 ± 0,3 до 5,9 ± 0,2 недель беременности ($p < 0,001$); Средний размер узлов уменьшился на 3,5 ± 0,1 мм ($p < 0,05$). В целом, эффективность лечения составила 76,4 % [50].

3.2.2. *КВЧ-терапия в послеоперационном периоде у больных с миомой матки*

Всем больным ($n=30$), у которых миоматозно измененная матка соответствовала по размеру 10-ти неделям беременности и более, проводилась операция по удалению матки. Процедуры КВЧ-терапии начинались с первого дня после операции и продолжались в течение 10 дней. У большинства больных на фоне улучшения общего состояния отсутствовали послеоперационные гнойно-септические осложнения. Проявления иммуннодепрессии отсутствовали или были минимальными [27, 46].

3.3. *КВЧ-терапия больных с доброкачественными эпителиальными опухолями яичников*

Воздействие ММ ЭМИ (7,1 мм) осуществлялось в течение 10 дней, начиная с 8-го дня цикла, по 45 минут на область грудины в месте прикрепления 2-го ребра. Первый цикл из 10 сеансов проводился на 2-й месяц после хирургического удаления опухоли, второй — на 4-й месяц. Контрольное обследование проводилось до лечения, на 6-й месяц и через один год после операции.

Результаты лечения были следующие: у женщин, получавших сеансы КВЧ-терапии, выявлена нормализация секреции пролактина, фолликулостимулирующего гормона, эстрадиола и прогестерона; отмечено устранение сдвигов в иммунной системе, связанных с угнетением звеньев Т- и В-систем иммунитета; снижение исходно повышенной активности протеолитических ферментов и восстанавление баланса в системе протеазы/ингибиторы [29].

Таким образом, КВЧ-терапия у больных с гиперпластическими процессами в матке позволяет добиться улучшения течения заболевания как при монотерапии, так и на фоне гормонального или оперативного лечения. В обоих случаях наблюдалась стимуляция лейкопоэза и увеличение количества палочкоядерных лейкоцитов, а также коррекция гормонального фона преимущественно за счет прогестерона [27, 46].

4. КВЧ-терапия при лечении злокачественных новообразований

При злокачественных новообразованиях КВЧ-терапия применяется в комплексе с хирургическим лечением или наряду с химио- и лучевой терапией.

Использовались генераторы ММ ЭМИ «Явь-I» с длиной волны 5,6 и 7,1 мм и «Луч-КВЧ» с длиной волны 7,1 мм. Методики лечения зависели от локализации опухоли и комплекса проводимой терапии.

4.1. *Лечение злокачественной меланомы кожи*

КВЧ-терапия проводилась после хирургического (лазерного) удаления первичного очага. Воздействие осуществлялось путем контактного облучения зоны решетчатого лабиринта или затылочной области в течение 30-60 минут. Количество сеансов достигало 10-15. Как правило, полный курс лечения состоял из четырех этапов: 1-й — непосредственно после операции; 2-й — через 1 месяц после первого курса; 3-й — через 3 месяца после 2-го курса; 4-й — через 6 месяцев после 3-го этапа лечения.

Независимо от локализации и глубины инвазии, отмечено снижение частоты рецидивов и метастазов. Так в группе пациентов (n=56), которым проведено хирургическое или комбинированное (хирургическое и лучевое) лечение в течение 9-18 месяцев не было ни одного случая рецидива или метастазирования [33]. Пятилетнее наблюдение выявило локальные и отдаленные признаки генерализации лишь в 41,1 % случаев, в то время как в контроле эта цифра достигала 71,5 % [22, 24, 51].

4.2. *Лечение рака ЛОР-органов*

После оперативного лечения использовалась вышеописанная методика КВЧ-терапии. В группе, получавшей КВЧ-терапию, число гнойно-воспалительных осложнений сократилось более чем в 2 раза, при этом увеличилось число больных, у которых рана заживала первичным натяжением. Отдаленные результаты наблюдения показали также более чем двукратное уменьшение случаев рецидивов (с 29,1 % до 12,0 %) и метастазирования (с 43,7 до 22,0 %) опухоли [24].

4.3. *Лечение рака толстой кишки*

КВЧ-терапия, проводимая по стандартной методике, позволяет улучшить непосредственные и отдаленные результаты оперативного лечения рака толстой кишки. Под наблюдением было 2 группы больных: в первой группе (n=24) оперативное лечение сочеталось с КВЧ-терапией, во второй группе (n=23) использовалось только оперативное лечение. Получены следующие результаты в зависимости от применяемого лечения: в I-й группе заживление раны первичным натяжением произошло у 19 человек, заживление вторичным натяжением у 5 человек, рецидивы заболевания в I-й группе выявлены у 3 человек, метастазы – у 7 человек, во II-й группе заживление раны первичным натяжением произошло у 7 человек, заживление вторичным натяжением - у 16 человек, рецидивы заболевания выявлены у 7, а метастазы – у 15 [24].

4.4. *Лечение рака молочной железы*

Под наблюдением находились больные со IIб и IIIб стадиями, которым проводился курс химиотерапии.

Курс КВЧ-терапии состоял из 14-15 ежедневных процедур: в течение 3-х дней до начала курса химиотерапии, в последующем — перед введением химиопрепаратов и в течение 3-х дней после прекращения курса химиотерапии.

Получены следующие результаты лечения: назначение КВЧ-терапии позволило провести полный курс химиотерапии при общем удовлетворительном состоянии и без применения гемостимулирующих препаратов — у 95,1 % больных, в контрольной группе у 79,2 %, причем, со значительными клиническими отклонениями в общем состоянии. Гемопротекторный эффект КВЧ-терапии проявился в том, что не наблюдалось снижения количества моноцитов и лимфоцитов в периферической крови. Количество лейкоцитов снизилось до 3500-3000 в 13,6 % случаев (в контроле - 32 %), менее 3000 — в 4,5 % (в контроле 18,0 %). Пирогеналовая проба, определявшая лейкоцитарный резерв костного мозга, выявила послеоперационный лейкоцитоз у 39 % больных, получавших КВЧ-терапию (в контроле 20 %). Данных за угнетение костного мозга получено не было. В проведенном исследовании выявлена достоверная стабилизация кроветворения, реализуемая как за счет выброса резервной крови из депо и уменьшения миелотоксического эффекта противоопухолевых препаратов, так и за счет активации костномозгового кроветворения [21-22, 38].

Аналогичные результаты описаны другими авторами, использовавшими КВЧ-терапию для стимуляции лейкопоэза у больных, получавших химиотерапию по поводу рака грудной железы [37]. Здесь же продемонстрирована возможность применения КВЧ-терапии у онкологических больных для лечения широкого круга сопутствующих заболеваний, включая острое респираторное заболевание, адгезивный арахноидит, гипертоническая болезнь, хронический бронхит, хронический гастрит, язвенная болезнь двенадцатиперстной кишки и некоторые другие [37].

4.5. *Лечение рака тела матки (2-я стадия)*

Комплексное лечение больных раком тела матки включало оперативное вмешательство, КВЧ-терапию на область грудины с 3-го по 8-й день после операции и лучевую терапию в течение 4-5 недель, начиная с 15-16 дня после операции.

У больных, получавших КВЧ-терапию, отмечен иммуннопротекторный и иммунномодулирующий эффект с сохранением субпопуляции Т-хэлперов как после оперативного лечение, так и после лучевой терапии [46-47, 54].

4.6. *Лечение рака желудка и легких*

Больным, оперированным по поводу рака легких или желудка, проводилась многоканальное КВЧ-воздействие (7,1 мм) по четырем точкам акупунктуры. Лечение начиналось на следующий день после операции и включало 3-5 сеансов, длительностью по 30 минут. На фоне проводимого лечения удалось предотвратить или значительно снизить выраженность таких послеоперационных осложнений, как пневмония и несостоятельность анастомоза. Восстановление основных показателей гомеостаза (показатели клеточного и гуморального звеньев иммунитета, медиаторы крови) протекала в два раза быстрее, чем в контрольной группе. Отмечена быстрая положительная динамика показателей «функционального энергетического состояния организма» по данным электрокожного сопротивления, контролируемого с помощью диагностического аппарата «РОФУС-24К» [30].

4.7. *Лечение больных с лимфомами и солидными новообразованиями*

Больные с лимфомами и солидными новообразованиями получали лучевую или комбинированную терапию. Для реализации гемостимулирующего эффекта применялся аппарат «Явь-I» (5,6 и 7,1 мм) на область мечевидного отростка грудины и затылочного бугра в течение 7-10 минут или только на область грудины в течение 30 минут, а также местно для лечения осложнений лучевой и комбинированной терапии. Курс лечения состоял из 5-15 процедур. После применения КВЧ-терапии у 60 % больных отмечено улучшение показателей периферической крови уже после 6-8 сеансов. Результатом местного применения ММ ЭМИ явилась ликвидация отека и боли к 6-10 сеансу и ускоренная эпителизация зон повреждения [40].

Таким образом, основными положительными эффектами КВЧ-терапии в комплексном лечении злокачественных новообразований были:

- уменьшение послеоперационных осложнений;
- уменьшение выраженности побочного действия химиотерапии и лучевого воздействия;
- гемопротекторный и иммуномодулирующий эффект;
- снижение числа рецидивов и метастазирования.

5. Показания к использования КВЧ-терапии в онкологии

1) Подготовка к радикальному лечению: лечение сопутствующих заболеваний и состояний, предупреждение развития токсического эффекта химио- или лучевой терапии и улучшение их переносимости.

2) Ликвидация осложнений после радикального лечения (оперативное вмешательство, химио- и лучевая терапия): лейкопения, гипопластическое

состояние костного мозга, побочное действие химиопрепаратов и лучевого воздействия, послеоперационные гнойно-воспалительные осложнения.

3) Потенцирование эффективности различных методов лечения, применяемых в онкологии: лазеротерапия, наркотические средства, психотропные и обезболивающие препараты и др..

4) Лечение паранеопластического синдрома.

5) Паллиативная КВЧ-терапия у некурабельных больных: нарко-седативный эффект, анальгезирующий эффект и противовоспалительное действие.

6) Предупреждение прогрессирования опухолевого процесса после комбинированного лечения: метастазирование, рецидивирование и диссеминация.

Прямых противопоказаний к использованию ММ ЭМИ не выявлено.

Таким образом, практически каждому онкологическому больному, по тем или иным показаниям, может быть назначена КВЧ-терапия [8, 22-25, 29, 36, 39, 41, 53].

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Extremely High Frequency (EHF) – Therapy in Oncology
(review)

M.V.Teppone, R.S.Avakian

This article represents a review of the literature dealing with application of low intensity electromagnetic waves of millimeter band in experimental and clinical oncology.

Phenomenon of «De Qi» or Sensory reactions during EHF-Puncture

MIkhail Teppone, Romen Avakian, Igor Karneev

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«Arrival of Qi» in traditional Chinese medicine

Phenomenon of «Arrival of Qi» (De Qi) was described from the very beginning of acupuncture. At the ancient time in the classic Chinese books it was written, that «acupuncture therapy does not take effect until arrival of Qi». Later they noticed, that quick arrival of Qi suggested good effects in treatment, slow arrival of Qi retarded effects in treatment. If there is no needling reactions, doctor should concentrate his mind, insert needle to a certain depth, apply special manipulation and wait for Qi, which «seems a fish bites on fishing pulling the line downward».[1,2] So «Arrival of Qi» is especially important phenomenon in acupuncture.

Modern investigations of «Arrival of Qi» phenomenon

If needle is inserted to a certain depth, the patient may feel soreness, numbness or distention at the place of needling. In this case it is possible to observe the changes of the biophysical parameters of the skin around the point.

Special needle manipulation can stimulate different sensations, moving along legs, arms or trunk. They are named the phenomenon of «propagated sensations along the channels» (PSC). There are manifest and latent PSC, but both of them can be detected by changing the low electrical resistance, cutaneous potentials, sound signals, temperature, spontaneous visible light, etc.

Changes in functional activity of the certain organs can be observed when PSC arrives in their region.[3-5]

Classification of «Arrival of Qi»

Analysis of the literature on acupuncture and our own experience has persuaded us to accept the phenomenon of «Arrival of Qi» broader, than it is usually has been done. We consider that any reactions (latent or manifest) of the point-channel system, stimulated by the influence upon Acupoints or by Qi Gong practice, including appearance or disappearance of different clinical manifestations of diseases, belong to the phenomenon of «Arrival of Qi». One should not confuse: «Arrival of Qi» is not same as a presence or absence of any symptoms. But it is phenomenon of changing the Qi condition at the points, channel, organ, element, etc., which can be accompanied by various sensory reactions, including changing the intensity, appearance or disappearance of some symptoms. Intensity of «Arrival of Qi» phenomenon defines the speed of changing Qi condition of the certain structures and effect of treatment.

Phenomenon of «Arrival of Qi» can be classified in accordance with:
- functional condition of the patient,
- structures involved into the reaction,
- type of Qi stimulated into the reaction.

I. Initial functional condition of the patient and his structures:
a) «Arrival of Qi» appearing in case of Excess of the Acupoints, Channel, Organ, Sea, etc.
b) «Arrival of Qi» appearing in case of Deficiency of the Acupoints, Channel, Organ, Sea, etc.

II. Structures, involved into the reactions:
a) Local sensory reactions at the place of acupoint,
b) «Propagated sensations along the channel»,
c) «Arrival of Qi» of the Organ or more complex and deep structures: element, sea, Yin, Yang.
III. Etiology of the disease and the type of Qi, involved into the reactions:
a) Exogenous factors and Wei Qi mainly,
b) Emotional factors and Ying Qi mainly,
c) Genetic reasons and Yuan Qi mainly.

Extremely High Frequency (EHF) - Puncture

Last 30 years at the territory of the previous Soviet Union extensive research on the problem of biological effects and medical application of low intensity millimeter (MM) band electromagnetic radiation (EMR) have been conducted (wavelength 10.0-1.0 mm, frequencies 30.0-300.0 GHz, power 1.0-0.001 mW).[6-8]

At the beginning of this investigations they considered, that every living organism had his own or «resonance» frequencies. This hypothesis was a base of the Microwave Resonance Therapy (MRT).[9] During the first procedure of the treatment a doctor acted on the skin projection of some patient's acupoint by means of MM

EMR, changed the frequencies of the radiation and monitored the sensory reactions of the patient. Usually patients had sensations of warm or cool, waves or creeps and others at the certain region or moving along the extremities and trunk. Some of patients had changes of their emotional condition and so on. The comfortable sensations appearing at the place of «sick organ» served as a criterion for individualization of the therapeutic frequency. During the sensory reactions, the changes of the functional activity of different organs were observed and detected by means of electrocardiograph, electroencephalograph, electro-gastrography, heat monitor, etc.[9-11]

We took the temperature at the skin projections of Acupoints and revealed that sensory reactions were accompanied be changes of the temperature at the certain acupoints. For example, feelings of «fullness and heaviness in the abdomen» was accompanied by increase of the temperature (0.2-0.5oC) at the points Ren-12 (Zhongwan) and St-25 (Tianshu), but feelings of «emptiness and lightness in the abdomen» was accompanied by decrease of the temperature at the same points. Sensation of «vertigo» was accompanied by changes of the temperature at the Liver Channel points. Feeling of «changes of the weight» was accompanied by the changes of the temperature at the Spleen Channel points, etc.[12]

The correlation between the patients' sensations and changes of the temperature at the Acupoints permitted of suggestion, that the sensory reactions occurring during Microwave Resonance Therapy were the same as the phenomenon of «Arrival of Qi» known from Traditional Chinese Medicine.

Later we already had enough theoretical, experimental and clinical data to be sure, that in EHF-therapy the leading role in enhancing the treatment efficacy was played not by the MM EMR frequency but by the zone-acupoint to which the radiation was applied.[13-15] The frequency determined the peculiarity of MM EMR to be absorbed by the water-contained structures of the skin,[16-17] the absorption and reflection and hence, the intensity of irritation of the stimulated zone. The end nonspecific effects of EHF-therapy were realized by means of participation of various regulator systems of macro-organism.[14]

The individualization of the Acupoints in accordance with TCM and the stimulation of the «Arrival of Qi» by means of the MM EMR have resulted in «Extremely High Frequency (EHF)-Puncture».

EHF-Puncture is needle-free, noninvasive and painless. The MM EMR is passed to skin projections of Acupoints through the dielectric wave-guide. Phenomenon of «Arrival of Qi» during EHF-Puncture has some peculiarities which reflect high therapeutic activity of this new puncture modality.[18]

«Arrival of Qi» during Extremely High Frequency (EHF)-Puncture

1. *The functional condition of the patient.*

They consider, that «for the effect of reinforcement and reduction, the functional status of the patient is the internal cause, while acupuncture manipulation is the external cause operative only through the internal cause... ». «...The effect of acupuncture manipulations depends on whether or not Qi is attained. When Qi is attained in patients with deficiency syndrome, this may be considered as the effect of reinforcing acupuncture, when Qi is attained in patients with excess syndrome, it is the effect of reducing acupuncture... ».[19]

EHF-Puncture can be applied in case of Deficiency and Excess. The modality of the EHF-influence depends on the duration of irradiation. For reinforcing effect the duration does not exceed 2-5 minutes. It is necessary to wait for the first sensory reaction appears. For sedating effect the exposure time should be 15-20-30 minutes. It is necessary to wait for the appearance of the sensory reactions, the buildup of their intensity and following subsiding. In case of patient with the syndrome of Deficiency, «Arrival of Qi« appears rather quickly. It correlates with the «place of Deficiency« and is comfortable usually. But in case of Excess at the beginning of the procedure patient may have aggravation of his initial presented symptoms (because of the reinforcing effect during the beginning of the EHF-influence), which disappear later.

2. *The structures involved into the reactions.*

During EHF-Puncture sensations at the place of influence observed in cases, when there is local disorders mainly. Usually in the beginning of the procedure different sensations moving along the patient's legs, arms, and trunk or just along the certain channel (warm, cool, waves, creeps, etc.) appear. After that the patient experiences various sensations, which reflect the elimination of his initially presented disorders. For example, a patient with the syndrome of Spleen Deficiency has symptoms of digestive system and «heaviness in the abdomen«. After 1-2 minutes irradiation on the point Sp-2 (Dadu) he begins to feel «increasing lightness in the abdomen or in the entire body«, «rocking«, or even «flying above the couch«. Irradiation of the point B-13 (Feishu) during 1.5 - 2.0 minutes for the Deficiency of Lung makes breathing to be deeper and prolonged. Some patients experience various «visual sensory reactions« in spite of the closed eyes that could be «changes of colors«, «appearance of light« or even more complex visual images looking like dreams.

But if there are no channel disorders, from the very beginning, a patient may have «Arrival of Qi» of the Organ without «propagated sensations along the channel».

EHF-Puncture may stimulate the «Arrival of Qi» of various structures by influence upon the one point. For example, female patient after pregnancy had obesity, irregular menstrual cycle, appearance bruises even after slight injury, dizziness and headache, but good complexion. These complaints could be diagnosed as

Excess of the Blood Sea. She needed the procedure named «draining the See of Blood» and required to be influenced on exit points of the Sea, confluent points of the Extra (Curious) channels connected with this Sea and group Luo-point. In this case, we used reduction (long-time) exposure on the points: St-37 (Shangjuxu), St-39 (Xiajuxu), Sp-4 (Gongsun) and Pc-6 (Neiguan) in turn; then we applied reinforcement (short-time) exposure on the Three Hand Yin Luo-point Pc-5 (Jianshi).

Acupoint St-37 (Shangjuxu) has various functions which belong to different structures and «depth»:
- it releases syndrome Excess on the top;
- the low He-Sea point of the Large Intestine;
- exit point of the Blood Sea.

In the beginning of the EHF-exposure on the St-37 (Shangjuxu) patient had «fullness and heat sensations in the chest and head». Then «moving in the abdomen» appeared. Afterwards there was appearance and aggravation of headache and dizziness. After disappearance of all these symptoms we could be sure that the point St-37 (Shangjuxu) had reacted as an exit point of the Blood Sea.

3. *Different type of Qi, involved into sensory reaction*.

Chinese syndrome diagnosis provides to know the etiology of disease and the type of Qi, which is necessary to correct.

a) Diseases caused by Exogenous factors: These diseases usually have syndrome of Excess at the certain acupoints, channel or organ. During the initial influence upon the points, where the Evil Qi can be dispersed (ashi, Shu-Stream, Jing-River, He-Sea, Luo-Connecting, Yuan-Primary, Xi-Cleft, Front-Mu, etc.) patient may have aggravation of the symptoms of his disease. But they disappear later. If there are syndrome of Deficiency of Tendino-Muscular or Luo-Channel, short-time exposure upon the necessary Acupoints to stimulate Wei Qi is accompanied by comfortable sensations at the corresponding place.

b) Diseases caused by Emotional factors: Patient may have Excess or Deficiency of some Regular Channels or Organs, caused by disorders between Yin-Yang or 5-Elements related pairs. In these cases the main role to treat belongs to restore the normal condition of Ying Qi.

If there are disorders between Yin-Yang related pairs, Yuan-Primary and Luo-Connecting points are applied. Usually short-time exposure on the Yuan point of the Channel with Deficiency is accompanied by appearance of comfortable PSC and then «Arrival of Qi» of the correlated Organ. Luo-point of the Channel with Excess responses on the EHF-influence quite slowly with appearance, aggravation and disappearance of uncomfortable PSC and Organ «Arrival of Qi».

Disorders between 5-Elements related pairs can be corrected by short-time EHF-exposure on the reinforcing and Back-Shu points of the Channel-Organ with Deficiency. PSC and Organ «Arrival of Qi» is comfortable and correlates with the function of this Organ.

In spite of the fact, that both Wei Qi and Ying Qi disorders can be of Excess type and during EHF-puncture uncomfortable «Arrival of Qi» appears, intensity of these discomfort will be different.

Wei Qi disorders with Excess are conditioned by the presence of Evil Qi which is reinforced at the initial time of the procedure. So uncomfortable sensory reaction is a usual phenomenon and can be rather intensive. Excess of Ying Qi is conditioned by the own human Qi and so in spite of some aggravation of the symptoms at the beginning of the EHF-influence, there is no additional complaints and uncomfortable «Arrival of Qi» is not so intensive and long as at the first case.

c) Diseases caused by genetic reasons: Yuan Qi cannot be in Excess condition. Constitutional or genetic disorders are Deficiency type usually: Deficiency of Yin or Yang, Deficiency of Sea or Deficiency of the certain Organ or Element, etc. All of these syndromes require reinforcement upon special Acupoints. It is preferable to apply higher frequencies of MM EMR and principles of Chinese chronotherapy. «Arrival of Qi» is not intensive and always is comfortable. Results of treatment appear slowly but may be rather stable. For example, a patient suffering from chronic lymphatic leukemia was treated be EHF-exposure on the «marrow Sea» points: Du-17 (Naohu) and Du-20 (Baihui). He felt that «something was coming inside his skull». Application of special radiometer to measure the deep temperature inside the skull revealed increasing the temperature on 1.0-1.5 Co at the depth of 6 cm (the penetration depth of MM EMR into living tissue does not exceed 0.1-0.2 millimeters). Superficial temperature of the skin did not change. The clinical and hematological improvement began two weeks later.

To conclude this theme we would like to point at the main peculiarities of the phenomenon of «Arrival of Qi» during EHF-puncture:

1) EHF-Puncture can stimulate different kinds of «Arrival of Qi» phenomenon without needle manipulation. Sensory reactions may even be observed in paralyzed extremities of spinal trauma patients;

2) EHF-Puncture can stimulate different kinds of «Arrival of Qi» phenomenon of various structures during influence upon one and the same acupoint;

3) During EHF-Puncture sensory response realizes not at the place of MM EMR exposure but at the place of «Qi» disorders;

4) During EHF-Puncture only one side of the body should be influenced but sensory response observed at the both sides.

Practical application of the «Arrival of Qi» phenomenon during EHF-Puncture

1. Individualization of the regimen of EHF-Puncture (the time of EHF-exposure): for reinforcement doctor should wait for the appearance of the first sensory reactions usually comfortable, but for the reducing method specific feelings must appear, become stable and disappear;

2. To make TCM diagnosis to be more exact in accordance with the:
- trajectory of the PSC,
- speed of appearance and disappearance of «Arrival of Qi»,
- nature of «Arrival of Qi».

For example: there is a problem with joints, so there is blocking the Shao Yang level [*Huandi Neijing Linshu*, chapter 5, «Roots & knots»]. But sometimes it is difficult to differentiate Excess or Deficiency nature of the blocking level. If the first sensory reactions appear after short-time (1-3 minutes) of EHF-exposure upon the «knot» point of the Shao Yang level - SI-19 (Tinggong) and they have comfortable or indifferent nature: waves, moving, warm, relaxation, etc., the diagnosis is Deficiency; but if sensory reactions appear after long-time (5-10 minutes) slowly and have uncomfortable nature: pain, numbness, tension, etc., the diagnosis is Excess, and so on.

3. To study additional functions and disorders of the different structures of the point-channel system and related phenomena. For example, simultaneous application of EHF-Puncture and Acupuncture may stimulate appearance of «visual» image looking like light cone surrounding the inserted needle.

4. To value preliminary effectiveness of the generator for EHF-Puncture, etc.

Conclusion

In spite of the fact, that EHF-Puncture makes the first or the second steps only, we hope that intensive and extensive «Arrival of Qi» phenomenon during this new puncture modality demonstrates great perceptiveness of its development.

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Феномен «De Qi» или сенсорные реакции при проведении квч-пунктуры

Теппоне М., Авакян Р., Карнеев И.

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1) Крайне высокочастотная терапия.

Крайне высокочастотная (КВЧ) или миллиметровая терапия является относительно новым методом лечения, основанным на различных биологических эффектах низкоинтенсивного электромагнитного излучения (ЭМИ) миллиметрового диапазона.[1−3]

На шкале ЭМИ КВЧ-диапазон располагается между инфракрасным излучением и сантиметровыми радиоволнами и включает частоты от 30 до 300 ГГц или длины волн от 10 до 1 мм,

В лечебной практике применяется когерентное излучение, при котором ЭМИ имеет определенную частоту и фазу, и «шумовое», которое является широкополосным излучением со случайно изменяющимися амплитудами и фазами волн.

КВЧ-пунктура относится к одному из вариантов КВЧ-терапии, при котором осуществляется индивидуальный подбор точек и зон воздействия на основании синдромного диагноза ТКМ.[4]

2) Сенсорные реакции при КВЧ-воздействии.

Согласно проведенным исследованиям, до 80 % здоровых испытуемых различают наличие КВЧ-воздействия посредством ощущений (сенсорная индикация).[5]

Электромагнитная чувствительность человека определяется как его индивидуальными особенностями, так и биотропными параметрами поля. Латентный период сенсорных реакций составляет до 40-60 секунд к предполагает участие нервного и гуморального звеньев рефлекторной дуги. Выявлена асимметрия при восприятии электромагнитного доля в зависимости от того, на какую руку (правую или левую) осуществлялось воздействие.

При воздействии на тыльную поверхность кисти [точку GI_4 *(Хэ Гу)*\ преобладали реакции типа «мурашки», «покалывание», (48,0 %), затем «давление», «тяжесть» (36,9 %), «прикосновение» (18,3 %), реже — «холод», «тепло», «жжение». Все ощущения локализовались либо в области ладони, либо в пальцах, т.е. в непосредственной близи от места приложения ММ ЭМИ.

При наличии местной патологии, ощущения обычно возникают в области КВЧ-воздействия. Например, во время лечения больных с трофическими язами, ощущения «покалывания», «пощипывания» и «давления» возникали непосредственно в зоне кожного дефекта , а при воздействии на область щеки у больных стоматологического профиля отмечались ощущения в виде легкого покалывания в деснах.[9]

При генерализованной патологии возникают общие и местные сенсорные реакции: ощущение тепла, покалывания, парастезии, исчезновение болевого синдрома и др. В процессе лечения, от процедуры к процедуре, интенсивность ощущений уменьшается.

Иногда наблюдаются случаи отсутствия сенсорных реакций несмотря на наличие положительного лечебного эффекта.[3]

Большинство авторов отмечают преобладание комфортных ощущений, указывающих, на благоприятный прогноз лечения.[1,3]

3) Сенсорные реакции в теории традиционной китайской медицины.

Создание методики КВЧ-терапии с индивидуальным подбором частоты ЭМИ или микроволновой резонансной терапии (МРТ) базировалось на гипотезе о наличии у различных биологических объектов собственных «характеристических частот». Подбор частоты осуществлялся на основании сенсорных реакций, возникающих у пациентов при воздействии ММ ЭМИ определенной частоты на ТА «общего действия». Сенсорные реакции рассматривались как «резонансный отклик» организма больного на узнаваемую им индивидуальную лечебную частоту.[1,10]

В ходе исследований по объективизации сенсорных реакций было выявлено, что ощущения, возникавшие у пациентов, сопровождались изменением температуры кожи в проекции ТА тех «каналов», с которыми были связаны эти ощущенияю[11] Полученные результаты позволили рассматривать имеющиеся у больных сенсорные реакции, как «феномен движения или прибытия энергии» («De Qi»), описываемый в традиционной китайской медицине (ТКМ).

В классическом китайском трактате Хуанди Нэйцзин Линьшу было написано: «...иглоукалывание не эффективно без достижения энергии...».

Если при иглоукалывании предусмотренные ощущения не возникали, врачу рекомендовалось сконцентрировать свое внимание, ввести иглу на должную глубину и ждать прихода энергии (Чи), которая подобна «рыбе, трепещущейся на крючке».[12,13]

Если игла введена на необходимую глубину, пациент может ощущать ломоту, распирание, покалывание и др. в области иглоукалывания. В этом случае можно выявить изменения биофизических параметров кожи вокруг иглы.

Использование специальной манипуляции иглой позволяет вызвать ощущения, распространяющиеся вдоль конечностей и туловища. Этот феномен носит название «ощущения, распространяющиеся вдоль канала» *(«propagated sensations along the Channels»* или PSC). Описывают проявляющиеся и латентные PSC, но в обоих случаях их можно диагностировать на основании изменения кожного сопротивления, изменения звукового сигнала, температуры, спонтанного сверхслабого свечения и др.

При достижении PSC соответствующего органа происходит изменение его функции.[14-16]

Считается, что «... для получения эффекта возбуждения или торможения ведущее значение имеет функциональное состояние пациента, а не манипуляция иглой...». «... наличие эффекта манипуляции иглой зависит от того, будет ли достигнут феномен прибытия энергии или нет. Если феномен De Qi был получен у пациента с синдромом Пустоты, то реализуется эффект возбуждения; если феномен De Qi получен у пациента с синдромом Полноты, то реализуется эффект торможения ...»

4) Сенсорные реакции при проведении КВЧ-пунктуры.

Следует обратить внимание на следующие характеристики ощущений: «время появление ощущений», «длительность ощущений», «комфортный или дискомфортный характер ощущений» и «специфичность ощущений».

(1) время появления ощущений:

- появление ощущений через 1-3 минуты отражает состояние «Пустоты» и указывает на необходимость тонизирующего КВЧ-воздействия,

- появление ощущений через 5-30 минут отражает состояние «Полноты» и указывает на необходимость тормозного КВЧ-воздействия;

(2) длительность ощущений напрямую связана с временем их появления:

- быстро появляющиеся ощущения обычно имеют тенденцию к быстрому исчезновению и отражают состояние «Пустоты»,

- медленно появляющиеся ощущения обычно сохраняются длительное время и отражают состояние «Полноты»;

(3) комфортный или дискомфортный характер ощущений:

- комфортный характер ощущений отражает состояние «Пустоты» и указывает на необходимость тонизирующего КВЧ-воздействия,

- дискомфортный характер ощущений отражает состояние «Полноты» и указывает на необходимость тормозного КВЧ-воздействия (иногда дискомфортные ощущения соответствуют жалобам, имевшимся у больного до начала лечения),

- индифферентный характер ощущений в виде мурашек, волн, парестезии, «движения» и др. отражает эффект гармонизирующего КВЧ-воздействия;

(4) специфичность ощущений:

- любое возникающее ощущение можно соотнести с тонизацией или торможением того или иного канала; например, тонизация канала Селезенки при ее Пустоте сопровождается появлением ощущения легкости в животе, в конечностях или во всем теле; тонизация канала Легких нередко сопровождается увеличением глубины и частоты дыхания, и т.д.,

- ощущение «тепла» характерно для эффекта тонизации или «согревания»;

- ощущение «холода» характерно для эффекта торможения или «охлаждения»; «мурашки», «волны», «покалывание» характерны для «гармонизирующего» или «выравнивающего» КВЧ-воздействия и отражают «движение *Qi»* по каналам;

- «зрительные» ощущения, возникающие при закрытых глазах и напоминающие сновидение, характерны для пациентов, причиной заболевания которых была психо-эмоциональная травма.

Таким образом, отличительной особенностью КВЧ-терапии является способность ММ ЭМИ вызывать сенсорные реакции или феномен прибытия *Qi* не только в точке или зоне воздействия, **но** и непосредственно в области нарушения, а сенсорные реакции, возникающие во время процедуры, позволяют уточнить синдромный диагноз ТКМ, оценить эффективность лечения и индивидуализировать время и другие режимы КВЧ-воздействия.

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Modern diagnostic technology applied in acupuncture

Mikhail Teppone, Romen Avakyan

ICMART Congress 2000: 9th World Congress on Scientific Acupuncture and Related Techniques
May 11-14, 2000, Palais Auersperg, Vienna, Austria, p. 31-32
https://icmart.org/icmart-congress-2000-vienna-austria/modern-diagnostic-technology-applied-in-acupuncture/

For effective treatment it is vital to have a «syndrome diagnosis» of TCM, which allows to choose the necessary acupoints and the regime of treatment.

The following classical methods of diagnostics are used in TCM: inspection, auscultation, olfaction, inquiring and palpation.

The obtained data is analysed in order to provide the localization of the disease (*Exterior or Interior*), condition of Qi (*Excessive or Deficiency*), the type of disease (*Heat or Cold*) and evaluation of disease: (*from the Exterior toward Interior*, *from the Interior toward Exterior*, *between elements*, etc.) and general characteristics of the patient's condition (*Yang* or *Yin*).

Modern diagnostic methods correlated with TCM:

To determine TCM diagnosis by means of the modern technique one should measure any parameters known in modern pathophysiology but the same parameters must be adapted to the criteria applied in TCM.

An effective method to diagnose external diseases (Channels & Collaterals) is a «gas-discharge visualization» based on Kirlian's effect. This technology visualizes condition of Wei Qi and locates the pathological process. Another method of assessing the *Wei Qi* condition in external diseases is infrared thermograph.

In order to determine the condition of «Nutritive Qi» (*Ying Qi*) the measurement of electric parameters on the skin at the special acupoints is carried out. It may be provided by Ryodaraku (*Y.Nakatany*) technology or by the method of the least resistance points visualisation in the Electrostatic field of the high voltage corona discharge («AcuVision» device). In order to detect a type of illness («*Heat*» or «*Cold*») the skin sensitivity towards increases in temperature at the projections of the acupoints is measured (*K.Akabane*).

A special medical microwave radiometer has been developed to determine the temperature field distribution inside the body. It provides early detection of inflammatory and oncology diseases as well as determination of Internal «*Heat*» or «*Cold*» inside the patient's body. All the methods described above could be used by any trained doctor to determine traditional Chinese syndrome diagnosis and to improve treatment efficiency.

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Modern approach to differentiate diagnosis of TCM

M. Teppone, S. Elmen, D. Bugaev, R. Avagyan

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May 11-14, 2000, Palais Auersperg, Vienna, Austria, p. 33-34
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Traditional Chinese diagnosis is described by the principles of «Exterior» or «Interior», «Excess» or «Deficiency», «Heat» or «Cold» and Yang or Yin.

In this article we describe a new software/hardware complex, which is based on the measurements of the electrical conductivity of the 12 channels («*Ryodoraku*» method developed by *Y. Nakatany*) and skin sensitivity towards increases in temperature at the projections of «Jing» points (developed by *K.Akabane*). Additional units of Auriculo- and tongue diagnosis will be incorporated during the next stage of the development.

The measurement process is adapted to reflect the individuality of a patient. Thus, there is a possibility for adjustment to «child», «adult» and «old man» mode. In addition, the device incorporates the following features:

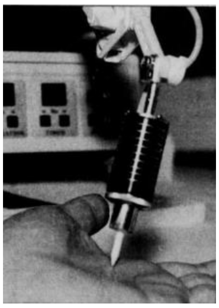
Screen: after the completion of measurements, a standard screen with the channels arranged in order of measurements (L-Pc-H-SI-TW-LI-Sp-Liv-K-BGB-St) may be switched over to the special screens to arrange channels in «Left-Right», «Hand-Foot», «Yang-Yin», «Triads», «5 elements», «Pairs» and other order.

Calculation: integrated software calculates data in accordance with the “General disorders» (general level of Qi, Kidney Qi, Heart Qi, interrelation between Stomach and Spleen), «Yang-Yin balance» (Yang-Yin, Left-Right, Hand-Foot), «Triads» (3 Yang Hand Left – 3 Yin Foot Right, 3 Yang Hand Right – 3 Yin Foot Left 3 Yang Foot Left – 3 Yin Hand Right, 3 Yang Foot Right – 3 Yin Hand Left), «Five elements» (Wood – Fire – Earth – Metal – Water), «Pairs of Channels» (Yang-Yin, Midday-Midnight, «Roots & Knots») and «12 Channels».

Block of strategy and tactics of treatment: the above mentioned software calculates necessary Acupoints, therapeutic methods and regime of treatment in accordance with the principles described above; a user may switch on a special Acupoints atlas.

Block of biorhythmology: calculates traditional Chinese chrono-biological parameters of the year, day and intervals and the main interdictions for treatment.

All blocks described above are presented as a united system.



EHF – Puncture:
Integration of ancient theory & Modern quantum technology

M.Teppone, A.Scott-Morley, R.Avakian

The 5th International Congress of Traditional Medicine & Acupuncture
Singapore, March 18-19, 2000 p. 81-87.[1]
https://archive.org/details/modern-diagnostic-technology-acupuncture

EHF – Therapy as a New Method of Treatment

Extremely High Frequency (EHF) - Therapy represents a new treatment method based the on various biological effects, produced in any living organisms, by a low-intensity electromagnetic radiation (EMR) in the millimeter (MM) spectrum of waveband. Millimeter waves (MMW) resides between infrared radiation and centimeter radio waves and include frequencies from 30 to 300 *GHz* or wavelengths from 1 to 10 *mm*.

Three types of electromagnetic radiation are used in practice: coherent, which has a fixed frequency and constant phase, and «noise-like» having a broad spectrum, with randomly varying amplitudes and phases, and its combination. MM EMW used in the medicine has low power, 1 to 10 *mW*.

It is supposed that general biologic and adaptation mechanisms are involved in the curative effect of EHF- Therapy.

According to one of the hypotheses, the primary target for MM radiation is water the molecule in any living organism. A change in the extent of hydration for the cellular membrane proteins results in their conformational changes, which affects the ion transport and synthesis and accumulation of adenosine tri phosphate acid. The ultimate effect of MMW radiation on the organism is formed with participation of the neuro-humoral system and depends on the particular organ, skin area or a point exposed to radiation.

Another hypothesis suggests that MMW propagate in the human body along the «channels» described in the traditional Oriental medicine (TOM). Any biological object, including human organism, has its own natural or «characteristic» frequencies, which should be chosen and applied for treatment.

Different types of biological effects, observed in MMW application, are the reasons that several major methods of EHF – therapy have been developed to date. It is well established today by theoretical, experimental and clinical data, that exposure point or area, rather than radiation frequency, plays an essential role in the treatments efficiency. High sensitivity of acupoints to MM radiation has been revealed, and this is probably explained by high hydration at these points. Acupoints are efficiently selected in TOM. Based on the patient's complaints and anamnesis of disease, appearance and tongue inspection, a syndrome TOM diagnosis is determined, which allows the selection of treatment points and methods.

Syndrome Approach of Traditional Chinese Medicine

Acupoints represent a complex system formed by the connective tissue with a large number of neural receptors and open neural ends, developed vascular system, various cell elements including biologically active substances, and aggregation of gap junctions (fig. 1). Neural and vascular processes only do not limit the acupoints functioning. All regulator systems of the organism should be involved in realization of EHF-/acupuncture effects. Functional parameters, which have the largest deflection from normal values, will be most intensively changed (normalized) by the EHF- or acupuncture.

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[1] This article was published without illustrations; pictures were presented at the Congress

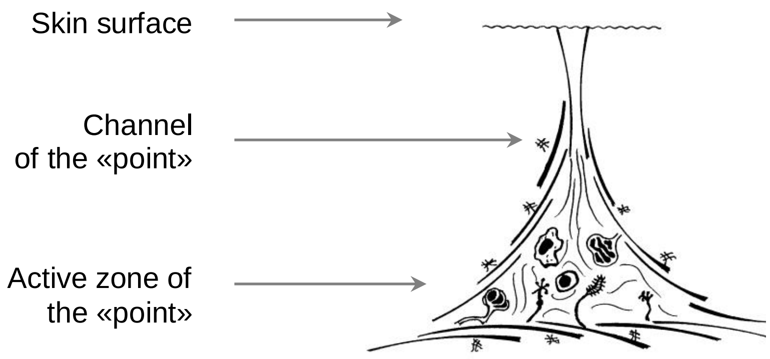

Skin surface
Channel of the «point»
Active zone of the «point»

Figure 1. There is a scheme of acupuncture points

Although the latest researches have thrown light on the mechanism of acupuncture effects they regretfully have not given any new recommendations on selection of exposure areas. TOM acupoint theory still remains the most productive source for the choice of acupoints for therapy.

The majority of patients present with the following three groups of symptoms:

1) Acute non-specific symptoms, which reflect the development of a General Adaptation Syndrome. These symptoms have been thoroughly described by the Chinese physician *Zhang Zhongjing* in the «*Treatise on Febrile Diseases Caused by Cold*». We recommend using the «Six Channels» theory to treat peptic ulcer, common cold, abstinence syndromes, and other acute diseases and states. In spite of differences in modern nosology of diagnoses, the same acupoints should be selected if «level» or «phase» is identical (fig. 2).

The treatment is either daily, or every other day. Fewer treatment sessions should be given when the organ is deeply affected and more frequently when the pathology is superficial.

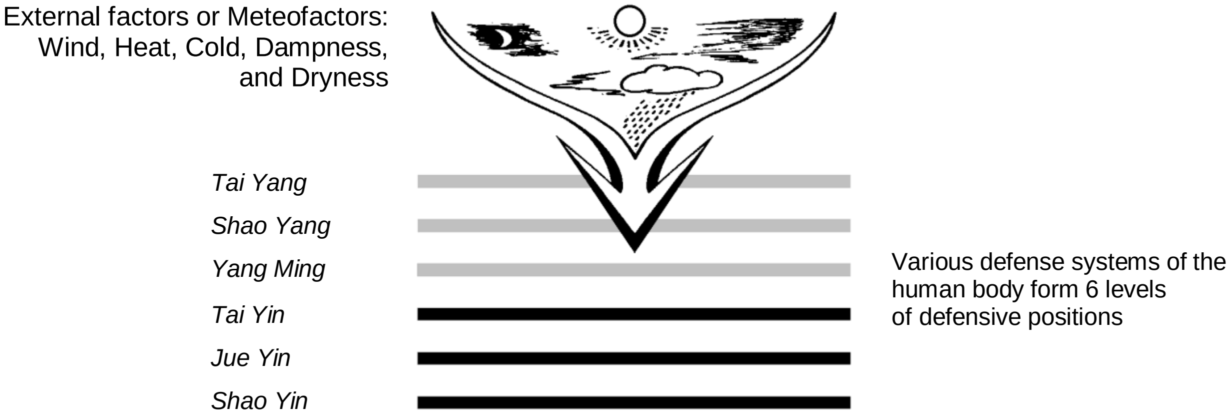

External factors or Meteofactors: Wind, Heat, Cold, Dampness, and Dryness
Tai Yang
Shao Yang
Yang Ming
Tai Yin
Jue Yin
Shao Yin
Various defense systems of the human body form 6 levels of defensive positions

Figure 2. Aggravation of diseases from “outside to the inside”

2) Specific symptoms, which reflect the characteristics of a particular disease, or localization of pathologic process. These symptoms are described by means of affection syndromes of «Channels and Collaterals», «*Zang* and *Fu* Organs» (fig. 3) and are used in treatment of peptic ulcer, gastric polyps, liver and kidney cysts, bronchial asthma, etc. Diagnostics may be different, depending on the following disease characteristics:

- Localization of disease: Regular channel, Tendino-muscular-, *Luo-* or Divergent vessels; *Zang* or *Fu* Organ; Wood, Fire, Earth, Metal, or Water Element, etc.;
- Type of Disease: Heat or Cold;
- Condition of the Defensive Qi: Excess or Deficiency;
- Etiology of disease: Exogenous or Emotional factors, Improper Diet, Stress, etc.;
- Pathogenesis of disease: transformation of disease either from Exterior to Interior, or from Interior to Exterior, or between the Elements.

Treatment rate is 2 or 3 sessions a week, with utilization of the major functional acupoints.

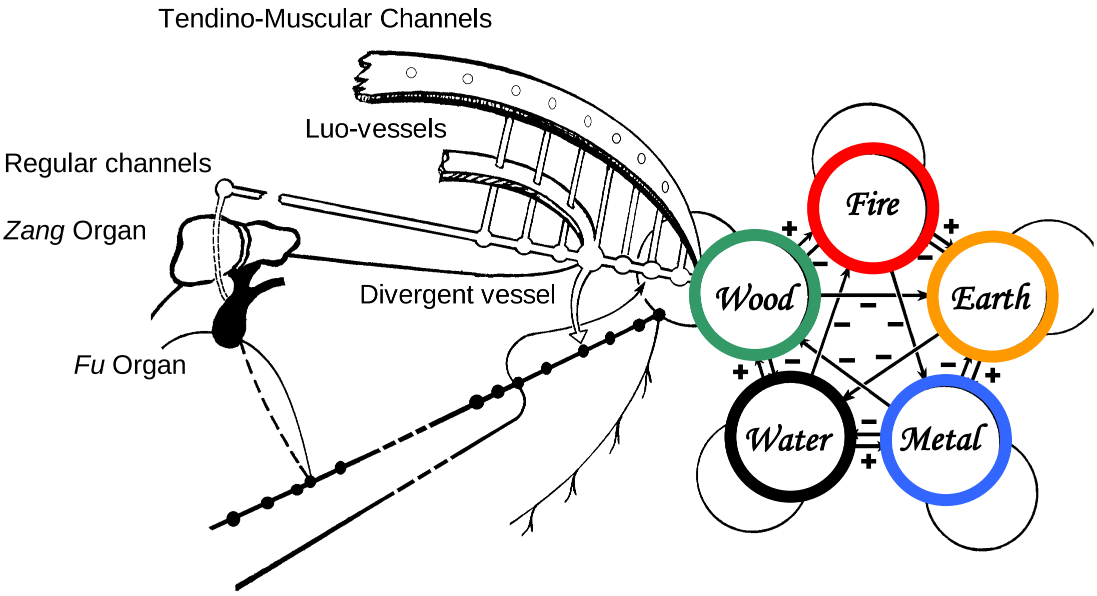


Figure 3. There are Theories of Channels, Collaterals, Organs and Five Elements

3) Chronic non-specific symptoms are related to the constitutional characteristics of the patient. The third group of symptoms is specified on basis of Deficiency of *Yin* or *Yang*, Four Seas, Blood & Energy syndromes, as well as Deficiency of *Zang* Organs and Five Elements theory. These syndromes are used as a rule in treatment of chronic diseases, such as a coronary heart disease, angina pectoris, bronchial asthma, high blood pressure, enuresis and so on. The same syndromes may be used in preventive therapy; prior to the aggravation of chronic disease is possible.

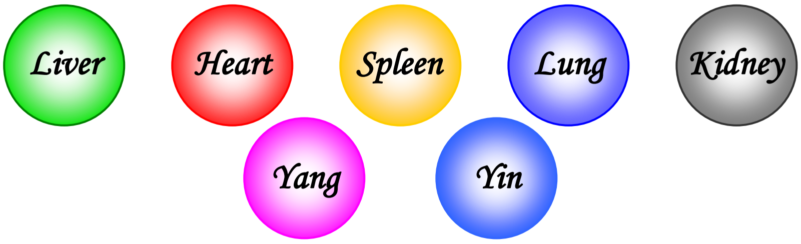


Figure 4. Constitutional Syndromes: Deficiency of Zang Organs, Deficiency of Yang & Deficiency of Yin.

Treatment usually should be undertaken 1 - 3 times a week. *Shu-Mu* therapy methods are recommended (*Mu* are the so called «alarm» points located on the front surface of abdominal wall, or thorax, while the back *Shu* points dispose along the Bladder Channel close to the spine.

Symptoms of an Extra- (or Curious) Vessels affect may be attributed to any of the groups of syndromes described earlier. Thus, for example, *Yang Jiao Mai* syndrome includes *Tai Yang*, *Shao Yang* and *Yang Ming* symptoms (fig. 5), while *Yin Wei* unites *Tai Yin*, *Shao Yin* and *Jue Yin* levels. The symptoms may be thus used in combination with the «Six Channels» theory, in the treatment of diseases caused by exogenous factors. Besides each Extra- Channel have its constitutional characteristics and pathologies of interior origin.

The body's right or left side may be selected according to the TOM theory, which does not allow dispersion or sedation of the «Yin side at the Yin time and Yang side at the Yang time». So for a dispersion or sedative effect one should treat the right side of the patient's body in spring and summer, but the left side in autumn and winter.

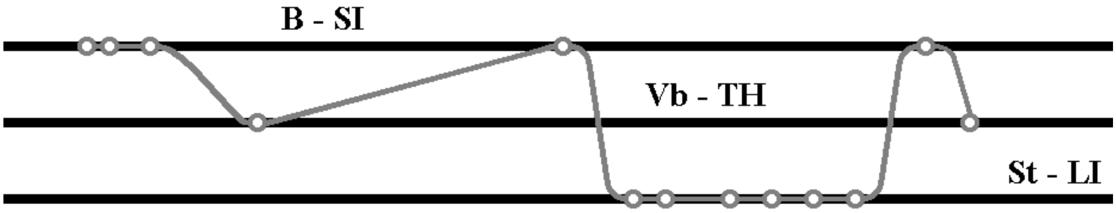


Figure 5. Yang Jiao Mai Extra Channel unites 3 Yang levels:
Tai Yang (B – SI), Shao Yang (Vb – TH) and Yang Ming (St – LI).

Though simultaneous exposure of several acupoints is possible, sequential application is preferable, first to reinforcing points and then to sedative points, except in specially indicated cases. This is explained by the fact that MMW stimulate sensor reactions, which allows the individualization of the time of each acupoint exposure.

Modality of EHF – Puncture

Millimeter-wave radiation may be used in treatment of the Excess and Deficiency type of diseases, as well as those characterized by Heat and Cold syndromes. Modality of the effect is determined by the acupoint exposure time.

1) Reinforcing or tonification effect of EHF-Puncture. To achieve reinforcing by means of EHF-puncture, the exposure time should not exceed 2 or 3 minutes. One has to wait in this case for the appearance of initial specific reactions (usually pleasant) and their increase to the maximum intensity. Usually the acupoints that require stimulation respond quickly.

2) Reducing or sedation effect of EHF-Puncture. To obtain a reducing effect, the exposure time may be 15-20-30 minutes or even longer. One has to wait for the specific (usually uncomfortable) sensations to appear, grow in intensity, stabilize and then disappear.

3) The exposure length, which should not exceed 0,5 to 1 min, may obtain the warming effect of EHF-Puncture, to treat Cold syndromes. Some patients note the warm sensation in the exposure area or other parts of the body. Pulse rate in this case is increased from 2 or 3 beats per breath [«Cold» syndrome] up to 5 [normal pulse to breath ratio]. Combination of MMW acupuncture and moxibustion is possible for treatment of Cold syndrome.

4) Clearing or Cooling effect of EHF-Puncture can be achieved by a 30 min or more EHF-exposure. In this case patient may have a feeling of «cooling» at various place of the body. Pulse slows down from 6-8 beats per breath [«Heat»] to 5 beats [normal]. To enhance the effect, EHF-exposure may be combined with needling of proper acupoints.

Although the specific sensations, which originate in the EHF-Puncture process, allow the determination of the individual exposure time quite accurately, but it should be kept in mind that patients having white and weakly tenable skin, require less intensive radiation than those having dark and well-tenable skin. In other words, the EHF-therapy must be less intensive for patients who have *Yin* Deficiency, than for those with Yang.

Specific Sensation or «Arrival of *Qi*» During EHF – Puncture

Phenomenon of «Arrival of *Qi*» (*Teh Chi*) was described from the very beginning of acupuncture. In ancient times in the classic Chinese books it was written, «acupuncture therapy does not take effect until arrival of *Qi*».

Modern investigations confirm that if the needle is inserted to a certain depth, the patient may feel soreness, numbness or distension at the place of needling. In this case it is possible to observe the changes of the biophysical parameters of the skin around the point. Special needle manipulation can stimulate different sensations, moving along legs, arms or trunk. They are named the phenomenon of «propagated sensations along the channels» (PSC) and can be detected by changes in the low electrical resistance, skin potentials, sound signals, temperature, spontaneous visible light, etc. Changes in functional activity of certain organs can be observed when PSC arrives in their region.

EHF-Puncture can be applied both in case of Deficiency and Excess. In case of patient with the syndrome of Deficiency, «Arrival of *Qi*» appears rather quickly. It correlates with the «place of Deficiency» and is usually comfortable. In case of Excess at the beginning of the procedure the patient may have aggravation of his initial presented symptoms (because of the reinforcing effect during the beginning of the EHF-influence), which later disappear.

During EHF-Puncture sensations at the place of influence observed in cases, when there is mainly local disorders. Usually in the beginning of the treatment different sensations moving along the patient's legs, arms, trunk or just along the certain channel (warm, cool, waves, creeps, etc.) appear. After that the patient experiences various sensations, which reflect the elimination of his initially presented disorders. For example, a patient with the syndrome of *Spleen Deficiency* has symptoms of digestive system and «heaviness in the abdomen». After 1-2 minutes exposure on the point Sp_2 (*Da Du*) he begins to feel «increasing lightness in the abdomen or in the entire body», «rocking», or even «floating above the couch». Irradiation of the point B_{13} (*Fei Shu*) during 1.5 - 2.0 minutes for the *Deficiency of Lung* makes breathing deeper and more prolonged. Some patients experience various «visual sensory reactions» in spite of closed eyes. These sensations could include «seeing changing colours», «appearance of light» or even more complex visual images resembling dreams.

To conclude this theme we would like to point at the main peculiarities of the phenomenon of «Arrival of *Qi*» during EHF-puncture:

1) EHF-Puncture can stimulate different kinds of «Arrival of *Qi*» phenomenon without needle manipulation.

2) EHF-Puncture can stimulate different kinds of «Arrival of *Qi*» phenomenon of various structures during influence upon one and the same acupoint.

3) During EHF-Puncture sensory response are realized not at the place of MM EMR exposure but at the place of «*Qi*» disorders.

4) During EHF-Puncture only one side of the body should be influenced but sensory response is observed at both sides.

5) Sensory reactions, appearing during EHF-Puncture, help the doctor to quickly study traditional acupuncture theory.

Combination of EHF – Puncture with other Treatment Methods

The best treatment effect is obtained when different TOM methods are applied in accordance with indications. Any modern «western» therapeutic methods, when applied without their prior evaluation, from positions of TOM, may result in their *antagonistic* interaction and reduce the carried therapy efficiency. Combination of EHF-therapy with some of the present-day medicines often gives *overdose* effects, thus requiring that smaller doses would be used. Approximate syndrome characteristics of the current medicines should be obtained from analysis of their clinical side effects.

Indications for EHF – Puncture

Diseases of digestive organs, including:
∗ Peptic ulcers,
∗ Gastric polyps,
∗ Cholecystitis,
∗ Gastritis, duodenitis, colitis, hemorrhoid;

⇒ *Diseases* of respiratory organs, including:
∗ Bronchial asthma,
∗ Rhinitis, sinusitis, chronic bronchitis;

⇒ *Diseases* of cardio-vascular organs, including:
∗ Some forms of coronary heart disease,
∗ Hypertension and neurocirculation disorders;

⇒ *Neurological diseases*, including:
∗ Neuralgia, neuritis, paresis,
∗ Initial stage of multiple sclerosis,
∗ Pain and other syndromes caused by vertebral disorders;

⇒ *Orthopedic diseases*:
∗ Arthritis, arthralgia and arthrosis, including Perthes disease;

And also:
In oncology: hemo-protective and immuno-reinforcing effects;
In narcology: EHF - detoxification, drug addiction;
In pediatrics: infantile cerebral palsy;
In gynecology: sterility, adnexitis, fibroma uteri;
In dermatology: neurodermatitis, psoriasis, eczema, alopecia;
In sexopathology: frigidity, impotence, prostate disease etc.

Contraindications for use of EHF – Puncture

No contraindications have so far been revealed for the application of EHF-therapy, except probably the *low* skill of medical personnel. However certain TOM syndromes require that medicinal therapy would be used first, followed by acupuncture, moxibustion of EHF-therapy.

Side Effects of EHF – Puncture

One may say that the low-power MM radiation does not give rise to any complications. Still, non-adequate use of acupoints due to incorrect TOM diagnosis may either aggravate the existing or create new symptoms.

The Most Important Special Properties of the EHF – Puncture

In spite of the fact, that EHF-Puncture proclaims the same principles as traditional Acupuncture and Moxibustion, we would like to point on the most important properties of this new version of the needles-free influence on acupoints.

1. EHF-Puncture is non-invasive: MM EMR is transmitted to selected acupoints by means of a special dielectric wave-guide and, therefore, there is no problem with sterilization of instruments or danger of bacteria or viruses transmission from one patient to another.

2. EHF-Puncture is painless: this peculiarity is very important during treatment of patients with a high sensitivity to pain.

3. EHF-Puncture is universal: MM EMR can be used to treat «Heat» or «Cold», «Deficiency» or «Excess» syndromes; the type of response depends on the initial condition of the patient and the exposure time depends on responses of the patient. For a reinforcing effect the duration of exposure should not exceed 2−5 minutes and one should wait for the first sensory reactions (usually comfortable) to appear and increase, for reducing effect duration of exposure may be 10-30 minutes and sensory reactions (usually uncomfortable) appear, increase, become stable and disappear slowly.

4. EHF-Puncture permits one and the same acupoints to be «reinforced» or «dispersed» several times during the same treatment. Each time sensory reactions occur and decrease in intensity from one influence to another.

5. EHF-Puncture can stimulate different kinds of «*Arrival of Qi phenomenon*» without needle manipulation. Sensory reactions may even be observed in paralyzed extremities of patients with injury to the vertebral column.

6. The most important peculiarity of MM waves is their possibility to stimulate specific sensory reactions (phenomenon ***De Qi***) not at the place of influence but at the place of ***Qi***-disorders directly. So, it can be applied for influence on the corporal traditional acupoints as well as points of different Microsystems: Ear, Palm, Sole, Nose, Pulse, etc.

Thus, EHF-puncture, based on the syndrome approach of traditional Chinese medicine, represents a new and efficient method for treatment of various diseases, including those whose etiology and pathogenesis are unknown, while nosologic diagnosis is difficult to determine and treatment methods are undeveloped.

КВЧ–ПУНКТУРА ПО ТОЧКАМ, ЛЕЖАЩИМ НА ЛИНИЯХ ЛАДОНИ

М.В. Теппоне, Р.С. Авакян,* С.Г. Веснин, С.Т. Эльмен*****
*ЗАО «МИЛТА» – ПКП ГИТ, **ООО «РЭС», г. Москва, ***ООО «Динас», г. Чебоксары

КВЧ – пунктура

Крайне Высокочастотная (КВЧ) пунктура базируется на различных биологических эффектах никзкоинтенсивного электромагнитного излучения (ЭМИ) миллиметрового (ММ) диапазона и акупунктурной теории традиционной китайской медицины.[1,2]

КВЧ-пунктура отличается от других вариантов КВЧ-терапии по следующим признакам:[3]

- Индивидуальный выбор точки или зоны воздействия играет ведущую роль в повышении эффективности лечения;
- Выбор точки или зоны воздействия осуществляется на основании синдромного подхода традиционной китайской медицины;
- Индивидуальная длительность КВЧ-воздействия определяется исходным состоянием пациента и контролируется по сенсорными реакциями, возникающим во время процедуры;

КВЧ-пунктура отличается от традиционной акупунктуры:

1) КВЧ-пунктура неинвазивна и безболезненна;

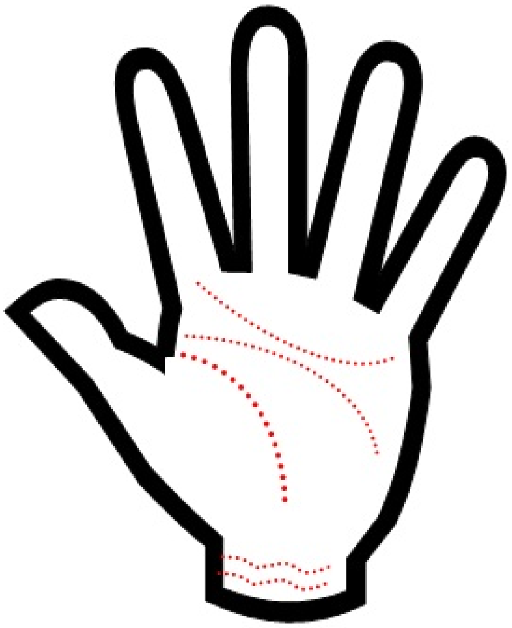
2) Сенсорные реакции или «*феномен прихода Qi*» возникает не только в зоне воздействия, но и в области условной локализации больного органа. Это позволяет эффективно использовать КВЧ-пунктуру как по стандартным точкам, лежащим на канале, так и по точкам, принадлежащим различным микросистемам (ушная раковина, ладонь, стопа, скальп, область носа и др).[1]

Линии и знаки ладони

На ладонях (и стопах) существуют различные знаки, образованные складками кожи, а именно: «линии», «холмы», «точки», «кресты» и т.д.

Считается, что они отражают возраст, состояние здоровья, различные события жизни и могут нести благоприятные и неблагоприятные признаки. Картина, написанная на руке, носит вероятностный характер и иногда меняется в определенных пределах.[4,5]

В работах, посвященных биорезонансной диагностике и терапии (БРТ), описывается методика проведения диагностики по «мантическим» точкам, лежащим на различных образованьях ладони. Отмечено, что в процессе лечения по «мантическим» точкам происходит улучшение клинического состояния больных, а также наблюдаются изменения рисунка ладони.[6-8]



КВЧ-пунктура по точкам, лежащим на линиях ладони

При использовании КВЧ–терапии по точкам, лежащим на линиях ладони, было выявлено следующее:

- При надавливании на ладонь в области линий и других знаков, можно выявить болезненные и нечувствительные точки;

- При КВЧ-воздействии на выявленные точки у пациента могут возникать комфортные или дискомфортные ощущения в различных участках тела, напоминающие сенсорные реакции, характерные для КВЧ-пунктуры (мурашки, волны, парестезии, тепло, холод и др.);

- При воздействии на болезненные точки, обычно возникают дискомфортные ощущения, а при КВЧ-воздействии на нечувствительные точки возникают индифферентные или комфортные ощущения;

- При воздействии на ТА, соответствующие «будущему» могут возникать дискомфортные ощущения, характерные для определенных заболеваний.

Например, у молодой женщины проведено КВЧ–воздействии на болезненную точку, лежащую на «линии жизни» и соответствующую 40-45 летнему возрасту. Через 2–3 минуты возникли ощущения загрудинной боли сжимающего характера, а также ощущение «давления» и «распирания» в грудной клетке. Интенсивность этих симптомов постепенно нарастала в течении 4–5 минут, затем стабилизировалась и пошла на убыль. Полное исчезновение вышеописанных симптомов произошло через 12–15 минут от начала КВЧ–воздействия.

Женщина, участвовавшая в «эксперименте», врач по образованию, считает себя здоровой и хорошо переносит физическую нагрузку. Ни до, ни после проведенного КВЧ–воздействия, аналогичных симптомов не возникало.

Вопросы, подлежащие изучению

- Существует ли объективная связь между знаками ладони и генетической информацией?

- Какие методы можно использовать для объективной оценки различных знаков ладони?

- Можно ли с помощью КВЧ-терапии устранять «следы» от перенесенных заболеваний и событий?

- Можно ли проводить профилактическое КВЧ-воздействие?

- Изменятся ли знаки ладони после курсового КВЧ-воздействия?

- Какие параметры КВЧ-излучения являются оптимальными и наиболее эффективными при работе со знаками ладони ?

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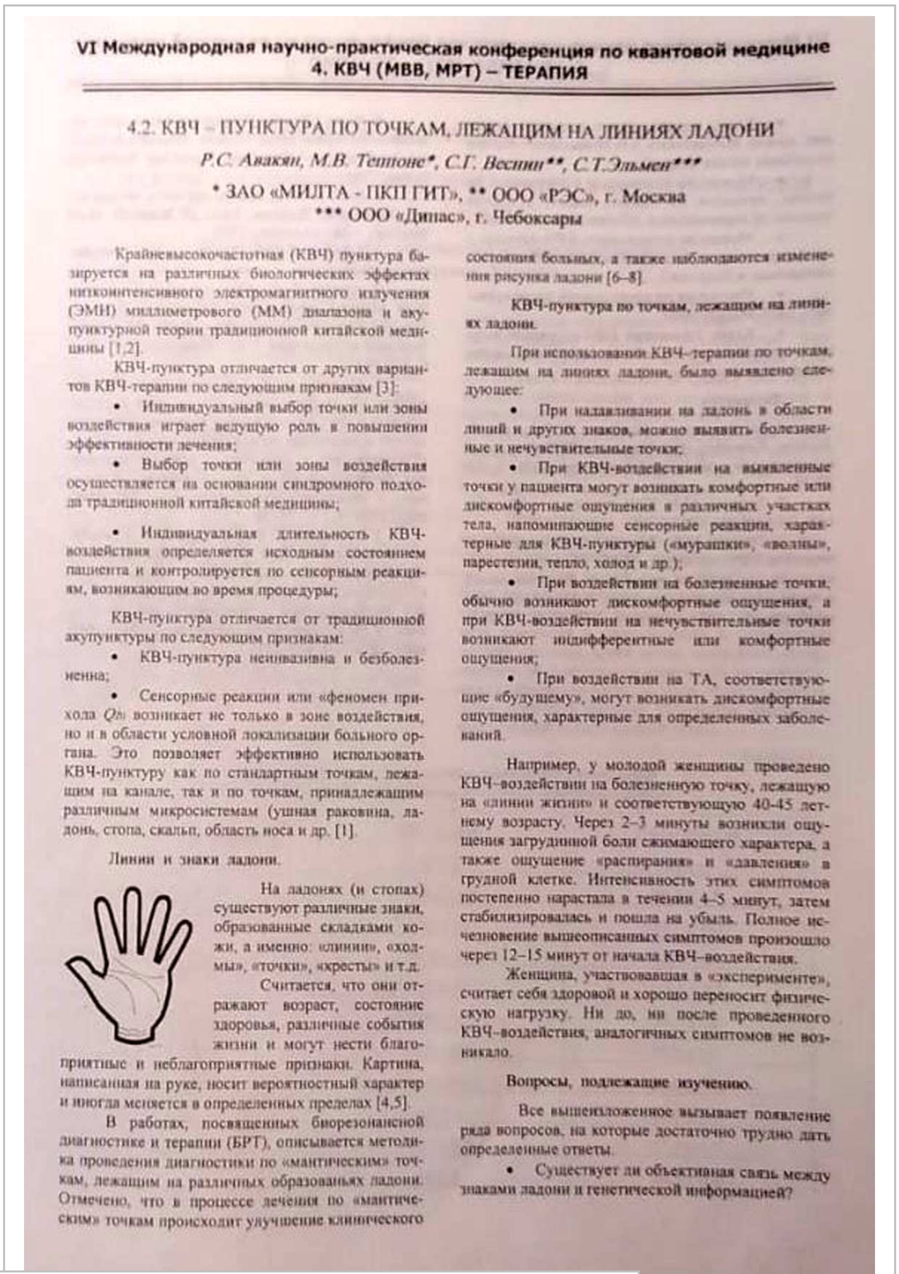


4.2. КВЧ – ПУНКТУРА ПО ТОЧКАМ, ЛЕЖАЩИМ НА ЛИНИЯХ ЛАДОНИ

Р.С. Авакян, М.В. Теппоне, С.Г. Веснин**, С.Т. Эльмен****

* ЗАО «МИЛТА - ПКП ГИТ», ** ООО «РЭС», г. Москва
*** ООО «Динас», г. Чебоксары

Крайневысокочастотная (КВЧ) пунктура базируется на различных биологических эффектах низкоинтенсивного электромагнитного излучения (ЭМИ) миллиметрового (ММ) диапазона и акупунктурной теории традиционной китайской медицины [1,2].

КВЧ-пунктура отличается от других вариантов КВЧ-терапии по следующим признакам [3]:

- Индивидуальный выбор точки или зоны воздействия играет ведущую роль в повышении эффективности лечения;
- Выбор точки или зоны воздействия осуществляется на основании синдромного подхода традиционной китайской медицины;
- Индивидуальная длительность КВЧ-воздействия определяется исходным состоянием пациента и контролируется по сенсорным реакциям, возникающим во время процедуры;

КВЧ-пунктура отличается от традиционной акупунктуры по следующим признакам:

- КВЧ-пунктура неинвазивна и безболезненна;
- Сенсорные реакции или «феномен прихода *Qi*» возникает не только в зоне воздействия, но и в области условной локализации больного органа. Это позволяет эффективно использовать КВЧ-пунктуру как по стандартным точкам, лежащим на канале, так и по точкам, принадлежащим различным микросистемам (ушная раковина, ладонь, стопа, скальп, область носа и др. [1].

Линии и знаки ладони.

На ладонях (и стопах) существуют различные знаки, образованные складками кожи, а именно: «линии», «холмы», «точки», «кресты» и т.д.

Считается, что они отражают возраст, состояние здоровья, различные события жизни и могут нести благоприятные и неблагоприятные признаки. Картина, написанная на руке, носит вероятностный характер и иногда меняется в определенных пределах [4,5].

В работах, посвященных биорезонансной диагностике и терапии (БРТ), описывается методика проведения диагностики по «мантическим» точкам, лежащим на различных образованьях ладони. Отмечено, что в процессе лечения по «мантическим» точкам происходит улучшение клинического состояния больных, а также наблюдаются изменения рисунка ладони [6–8].

КВЧ-пунктура по точкам, лежащим на линиях ладони.

При использовании КВЧ-терапии по точкам, лежащим на линиях ладони, было выявлено следующее:

- **При надавливании на ладонь в области линий и других знаков, можно выявить болезненные и нечувствительные точки;**
- **При КВЧ-воздействии на выявленные точки у пациента могут возникать комфортные или дискомфортные ощущения в различных участках тела, напоминающие сенсорные реакции, характерные для КВЧ-пунктуры («мурашки», «волны», парестезии, тепло, холод и др.);**
- **При воздействии на болезненные точки, обычно возникают дискомфортные ощущения, а при КВЧ-воздействии на нечувствительные точки возникают индифферентные или комфортные ощущения;**
- **При воздействии на ТА, соответствующие «будущему», могут возникать дискомфортные ощущения, характерные для определенных заболеваний.**

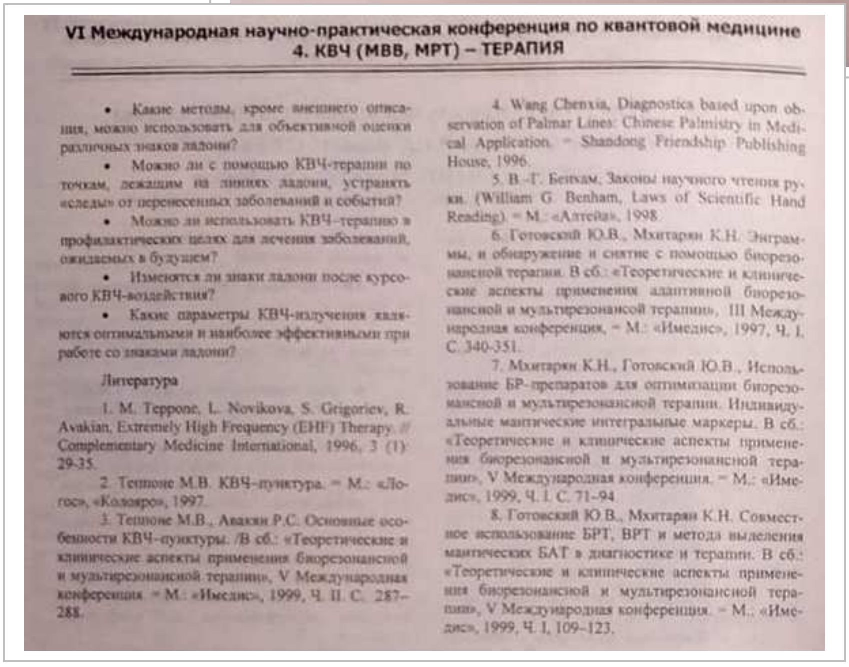
Например, у молодой женщины проведено КВЧ–воздействии на болезненную точку, лежащую на «линии жизни» и соответствующую 40-45 летнему возрасту. Через 2–3 минуты возникли ощущения загрудинной боли сжимающего характера, а также ощущение «распирания» и «давления» в грудной клетке. Интенсивность этих симптомов постепенно нарастала в течении 4–5 минут, затем стабилизировалась и пошла на убыль. Полное исчезновение вышеописанных симптомов произошло через 12–15 минут от начала КВЧ–воздействия.

Женщина, участвовавшая в «эксперименте», считает себя здоровой и хорошо переносит физическую нагрузку. Ни до, ни после проведенного КВЧ–воздействия, аналогичных симптомов не возникало.

Вопросы, подлежащие изучению.

Все вышеизложенное вызывает появление ряда вопросов, на которые достаточно трудно дать определенные ответы.

- **Существует ли объективная связь между знаками ладони и генетической информацией?**



- Какие методы, кроме внешнего описания, можно использовать для объективной оценки различных знаков ладони?
- Можно ли с помощью КВЧ-терапии по точкам, лежащим на линиях ладони, устранять «следы» от перенесенных заболеваний и событий?
- Можно ли использовать КВЧ-терапию в профилактических целях для лечения заболеваний, ожидаемых в будущем?
- Изменятся ли знаки ладони после курсового КВЧ-воздействия?
- Какие параметры КВЧ-излучения являются оптимальными и наиболее эффективными при работе со знаками ладони?

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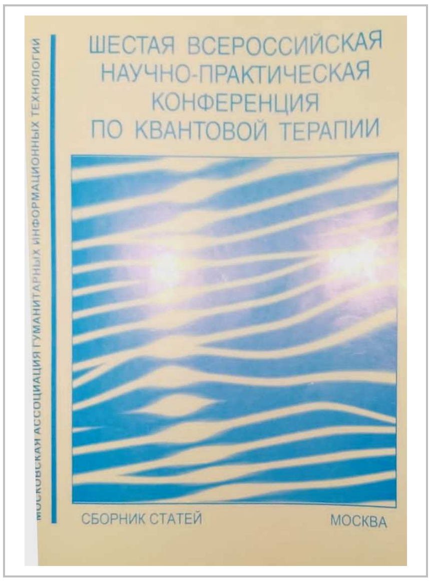


ШЕСТАЯ ВСЕРОССИЙСКАЯ
НАУЧНО-ПРАКТИЧЕСКАЯ
КОНФЕРЕНЦИЯ
ПО КВАНТОВОЙ ТЕРАПИИ

МОСКОВСКАЯ АССОЦИАЦИЯ ГУМАНИТАРНЫХ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИИ

СБОРНИК СТАТЕЙ

МОСКВА

EHF-Puncture on the Points of the Palm

(This abstract was not published in the original Preceedings)

M.Teppone, R.Avagyan, S.Vesnin, S.Elmen

Extremely High Frequency (EHF) or Microwaves – Puncture is a method of treatment which applies low intensity electromagnetic waves of millimeter band (from 10 to 1 millimeters). EHF-Puncture proclaims the same principles as traditional Acupuncture and Moxibustion but has some peculiarities: it is non-invasive and painless, it can stimulate different kinds of "*Arrival of Qi phenomenon*" without needle manipulation not only at the place of influence but at the place of ***Qi***-disorders directly: uncomfortable feelings (*Arrival of Qi phenomenon*) reflect dispersion effect in case of Excess, but comfortable sensory reaction reflects reinforcing effect in case of Deficiency. It can be applied to influence on the corporal traditional acupoints as well as points of different microsystems: Ear, Palm, Soul, Nose, Pulse, ECIWO, etc.

Palmistry is a *science* which describes various palm patterns and their correlation with the "health", "success" and other events which may take place during somebody's life. There are *lines*, *hills*, *points*, *lakes*, *crosses* and other favorable and unfavorable signs. One assumes that palmistry provides to point exact age and reason of the certain events. Nevertheless, the *fate* is written not unalterably and signs may be even changed a little.

Recent investigations demonstrated that:

1) While pressure by means of tester, which looks like pencil, one may reveal painful or insensitive points along various palm patterns (for example, along "life line", "head line", etc.);

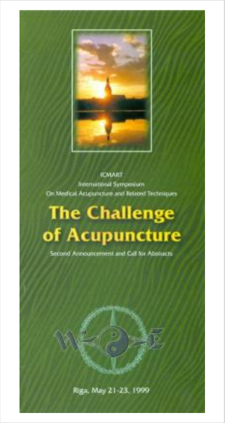
2) A patient (or healthy person) may be stimulated various sensory reactions (*Arrival of Qi phenomenon*) while EHF-puncture is used to act upon different patterns of the palm;

3) Sensory reaction or feelings appeared during EHF-Puncture on the palm patterns may be warmth or cooling, waves or creeps and others at the certain region or moving along the extremities and trunk;

4) If examination of the palm patterns by means of "pencil" reveals painful point EHF-puncture on this point stimulates uncomfortable sensory reactions or feelings, but if testing the palm patterns reveals insensitive points EHF-puncture stimulates comfortable or indifferent sensory reactions;

5) During EHF-puncture on the points which "belong to the future time or events" a patient (or healthy person) may have *Arrival of Qi phenomenon* at the place of the "healthy" organ yet;

Everything written above are previous results of the recent investigations only. Nevertheless we would like to attract doctors' attention to this report to incouring new method of treatment.



Extremely High Frequency (EHF) Puncture and Related Technique

M. Teppone, R. Avagyan, S.Elmen, S. Vesnin

«The Challenge of Acupuncture»: ICMART International Symposium on
Medical Acupuncture and Related Techniques, Riga, May 21-23, 1999, p. 55

EHF-Puncture: The EHF-Puncture applies low intensity electromagnetic radiation (EMR) of millimeter (MM) band [frequencies: 30 to 300 GHz or wavelengths: 10 to 1 mm]. In spite of the fact, that EHF-Puncture proclaims the same principles as traditional Acupuncture and Moxibustion, one may point at the most important features of this new version of the needleless influence on acupoints.

EHF-Puncture is non-invasive and painless. MM EMR can stimulate different kinds of Arrival of Qi phenomenon without needle manipulation not only at the place of influence but at the place of Qi-disorders directly: so, corporal traditional acupoints as well as points of different Microsystems Ear, Palm, Sole, Nose and Pulse points, may be applied to treat various diseases. The specific feelings at any places appearing during EHF-influence upon acupoints give possibility to individualize the duration of treatment: reinforcing (1-3 min.) or reducing (15-30 min.) methods.

EHF-Puncture and any methods of traditional Chinese medicine (TCM), including acupuncture (in case of Heat syndrome), moxibustion (in case of Cold Syndrome), oriental pharmacology and Qi Gong, may be combined to enhance the treatment efficiency.

Special devices [«Artsakh»] intended for EHF-Puncture therapy have been developed and manufactured. These devices are used on a solid state MM generator with a micro-processor managing system. They provide three radiation modes: coherent radiation at the frequencies of absorption lines of oxygen [60.0 and 118.0 *GHz*], *noise*-like radiation [from 42 to 95 and from 90 to 160 *GHz*] and combined radiation. It is possible to adjust output power, internal amplitude modulation (1-200 *Hz*) and exposure time. The generator head of each device may be provided with infrared or colour radiation.

Diagnostic Devices: To help doctors to put traditional Chinese diagnosis («Excess» or «Deficiency», «Heat» or «Cold») a new version of a PC-apparatus complex has been developed. It is based on the well known Ryodoraku (measuring the electrical conductivity of the «meridians») and Akabane (measuring the sensitivity of acupoints to heat) principles together with the traditional oriental chronotherapy.

Another special diagnostic device called «ACUVISION" has been developed for the purposes of testing the functional status of the patients' acupoints and channels. This device visualizes acupoints with low electrical resistance by means of illumination in a high-voltage corona discharge field. Intensity of illumination and relaxation time can be used as criteria of «Excess» syndrome at the certain acupoints and channels. «ACUVISION» visualizes acupoints on human or animal skin as well as on the surface of plants.

A medical radiothermograph (RTM-01) has been developed for the early detection of internal organs diseases. The detection of pathology is conducted by measuring intensity of natural electromagnetic radiation from the patients' internal tissues at microwave range and from the skin at the infrared range. As the changes in the tissues temperature precede the structural changes, radiothermograph can be used to diagnose diseases at the early stage and also to control the efficiency of any kind of therapy. During EHF-Puncture temperature changes on the skin surface and inside the body correlate with the arrival of Qi phenomenon and help a doctor to optimize the treatment regimen. Due to the absolute harmlessness of this examination it can be applied many times without any danger.

Thus, the complex of diagnostic and therapeutic devices based on the ancient theory of TCM and modern technology may provide early detection of any diseases and high efficiency of their treatment.

Основные особенности КВЧ – Пунктуры

М.Теппоне, Р.Авакян

«Теоретические и клинические аспекты применения Биорезонансной
и Мультирезонансной терапии» V Международная конференция
Москва, 16-18 апреля 1999, М.: «Имедис», Часть II, с. 287-288
https://archive.org/details/main-features-of-ehf-puncture/mode/1up

Крайне высокочастотная (КВЧ) пунктура основана на использовании различных биологических эффектов низко интенсивного электромагнитного излучения (ЭМИ) миллиметрового диапазона [длина волны 10-1 мм, частота 30-300 ГГц] и акупунктурной теории традиционной китайской медицины (ТКМ).

Несмотря на то, что КВЧ-пунктура использует те же принципы, что и традиционное иглоукалывание, тем не менее, необходимо обратить внимание на некоторые её особенности.

1) КВЧ-пунктура не инвазивна: ММ ЭМИ передается в область кожной проекции точки акупунктуры посредством диэлектрической антенны;

2) КВЧ-пунктура безболезненна, что особенно важно при лечении детей и пациентов с низким болевым порогом;

3) КВЧ-пунктура позволяет инициировать широкий спектр предусмотренных ощущений (т.е. феномен «Де Чи») без использования специальной техники иглоукалывания. Ощущения возникают как в месте воздействия, так и в области условной локализации больного органа;

4) КВЧ-пунктура применяется как при синдромах Полноты или Пустоты, так и при синдромах Жары или Холода. Модальность эффекта КВЧ-воздействия определяется длительностью воздействия на ТА. Для достижения стимулирующего или согревающего эффектов длительность облучения не более 1 - 3 минут. При этом необходимо дождаться появления специфических ощущений (как правило, комфортных) и их нарастания до максимального проявления. Для тормозного и охлаждающего эффектов длительность воздействия может достигать 15-20-30 минут и более. Требуется дождаться появления специфических ощущений (как правило, дискомфортных), нарастания их интенсивности, а затем исчезновения. Гармонизирующее КВЧ-воздействие продолжается 5-10 минут и сопровождается появлением и исчезновением индифферентных ощущений (мурашки, волны, движение и т.д.).

5) Максимальный лечебный эффект может быть достигнут при правильной постановки синдромного диагноза ТКМ. В некоторых случаях эффективно использование простых вариантов КВЧ-терапии: воздействие на широкие зоны (зоны Захарьина-Геда или области крупных суставов), отдельные точки (например - Е-36), а также различные микросистемы (ушная раковина, область носа, ладонь, стопа, диагностические точки пульса);

6) При проведении КВЧ-пунктуры можно использовать классические методы восточной диагностики, а также её современные модификации, основанные на измерении различных биофизических параметров кожи в области определенных точек акупунктуры (методы риодораку, Акабане, Фолля);

7) Эффективность КВЧ-пунктуры повышается при её сочетании, по показаниям, с различными средствами и методами ТКМ: иглоукалывание, прижигание, традиционная восточная фармакология, Ци Гун и др.

8) Использование КВЧ-пунктуры облегчает изучение основных принципов и законов ТКМ.

Acuvision – новое решение визуализации точек Акупунктуры

М.Теппоне, Р.Авакян, «Колояро – 2000», Москва

«Теоретические и клинические аспекты применения Биорезонансной
и Мультирезонансной терапии» V Международная конференция
Москва, 16-18 апреля 1999, М.: «Имедис», Часть II, с. 288-289
https://archive.org/details/acuvision-new-decision

Все известные методы выявления точек акупунктуры (ТА) и определения их функциональной активности базируются на контактном измерении различных биофизических параметров кожи в области ТА [*Y.Nacatani*, 1950; *R.Voll*, 1953]. Как правило, для этого необходимо предварительное знание локализации точек, а результаты измерения зависят от ряда субъективных и объективных факторов.

«AcuVision» объединяет в себе эффекты аппаратов франклинизации и электропунктуры. Заземленный биологический объект помещается в электростатическое поле высоковольтного коронного разряда, которое «стекается» в точки минимального электрического сопротивления на поверхности биообъекта. При этом реализуется эффект аэро-ионной пунктуры.

Для проведения обследования поверхность заземленного биологического объекта покрывается тонким диэлектрическим материалом (полиэтилен, бумага, хлопчатобумажная ткань). В электростатическом поле высоковольтного коронного разряда на диэлектрике возникает голубоватое свечение (феномен люминесценции).

Наибольшая яркость люминесценции наблюдается в области максимальной концентрации электростатического поля, т.е. над точками минимального электрического сопротивления. Диагностически значимыми являются такие параметры, как локализация, яркость и длительность свечения. Аппарат «AcuVision» позволяет проводить исследование ТА, находящихся на стандартных, фоллевских и бель-(Su Jok) меридианах, а также внемеридианальных ТА и точек различных микросистем (ушная раковина, нос и др.).

Единый комплекс, состоящий из аппарата «AcuVision», системы съема информации и PC со специальным программным обеспечением, позволяет проводить синдромную и, вероятно, нозологическую дифференциальную диагностику заболеваний.

При определенных режимах коронный разряд трансформируется в тихий искровой разряд, что обеспечивает реализацию дозированной электропунктуры.

Таким образом, аппарат «AcuVision» обеспечивает визуализацию точек минимального сопротивления на различных биологических объектах (кожа человека и животных, поверхность растений, плодов и фруктов), а также электро- и аэроионную пунктуру.

Традиционная Восточная Фармакология и КВЧ – Пунктура

М.Теппоне, Р.Авакян

V Всероссийская научно-практическая конференция по квантовой терапии
Москва, 8-11 декабря 1998, Сборник докладов, с. 45-46

Многолетний опыт применения крайне высокочастотной (КВЧ) пунктуры позволяет утверждать, что максимальный терапевтический эффект возможен при её сочетании с различными средствами и методами традиционной китайской медицины (ТКМ). При выборе точек акупунктуры и лекарственных препаратов врач должен поставить синдромный диагноз, который характеризует локализацию заболевания – «Снаружи» или «Внутри», тип заболевания – «Жара» или «Холод» и состояние энергии (Qi) тела – «Полнота» или «Пустота».

При болезнях «Снаружи» [«поражение каналов и коллатералей» или так называемые «функциональные нарушения»] рекомендуется использовать наружные методы лечения: иглоукалывание, КВЧ-пунктуру, прижигание и массаж. При болезнях «Внутри» [«поражение органов» или так называемые «органические нарушения»] наружные методы сочетаются с лекарственными препаратами ТКМ.

Каждый компонент прописи традиционной восточной фармакологии характеризуется «теплым» или «холодным» свойствами [холодный – прохладный – нейтральный – теплый – горячий], «вкусом» [кислый, горький, сладкий, острый, соленый и безвкусный или пресный] и тропностью к определенному каналу и органу.[1-2] Обычно используются рецепты, включающие от 4-5 до 20 и более компонентов.[3]

Принципы использования восточной фармакологии такие же, как при проведении акупунктуры, прижигания или КВЧ-пунктуры, что потенцирует лечебный эффект и предотвращает антагонистические взаимодействия. При синдромах «Пустоты» используются тонизирующие лекарственные препараты и точки акупунктуры (ТА), при «Полноте» – «рассеивающие» или «очищающие» лекарственные препараты и тормозные ТА, при болезнях «Жары» – точки и препараты, «очищающие Жару», а при болезнях «Холода» – «согревающие» лекарственные препараты наряду с прогревание ТА специальными полынными сигарами.

Возможны различные варианты сочетанного применения КВЧ-пунктуры и традиционной восточной фармакологии.

Потенцирование лечебного эффекта КВЧ-пунктуры с помощью традиционной восточной фармакологии. Например, у пациента при эндоскопическом исследовании выявлен дефект слизистой оболочки двенадцатиперстной кишки и имеются следующие клинические симптомы: боли в эпигастральной области, усиливающиеся натощак и уменьшающиеся в тепле и после приема пищи; снижение аппетита; тошнота, иногда рвота с выделением небольшого количества белой слизи; белый налет на языке, неоформленный стул 2–3 раза в день; отношение частоты пульса к частоте дыхания равно трем (в норме – 5: менее 5 – синдром «Холода», более 5 – синдром «Жары»).

На основании клинико-эндоскопических данных можно диагностировать язвенную болезнь двенадцатиперстной кишки и назначить общепринятую физиотерапию и современные противоязвенные препараты. Жалобы пациента (без эндоскопического исследования) позволяют поставить синдромный диагноз «Пустота – Холод Селезенки и Желудка» или 4-й уровень по теории «Шести каналов».[4]

Использование различных средств и методов ТКМ целесообразно проводить по следующей схеме:

1) рекомендуется употреблять «теплые» продукты питания, а также имбирь (*Zingiber officinale Rosc.*) в качестве специй,

2) лекарства ТКМ, согревающие и тонизирующие «Средний обогреватель»,
  - кора коричника китайского (*Cortex Cinnamomi Cassiae*),
  - корень пиона белоцветкового (*Radix Paeoniae Lactiflorae*),
  - корень солодки уральской (*Radix Glycyrrhizae Uralensis*),или
  - патентованный препарат Wen Zhong, «согревающий Внутри».[5]

3) лечение 4-го уровня (*Tai Yin*) с помощью КВЧ-пунктуры – тонизация точки Rp-3 (Тай Бай) и торможение точки E-40 (Фэн Лун),

4) прижигание (прогревание) точек Rp-2 (Да Ду), JM-12 (Чжун Вань), V-20 (Пи Шу) и V-21 (Вэй Шу).

При изменении симптомов заболевания уточняется синдромный диагноз и назначается соответствующая схема лечения. Отсутствие активных жалоб больного и нормализация «объективных» показателей состояния пациента (цвет языка, налет на языке, интенсивность окраски мочи и данные пульсовой диагностики) позволяют говорить о купировании обострения заболевания.

Профилактическая или поддерживающая терапия: Среди клинических проявлений, наблюдаемых при различных заболеваниях, можно выделить конституциональные или хронические неспецифические симптомы. По этим симптомам всех пациентов можно условно разделить на две большие группы.

В первой группе выявляются симптомы, соответствующие снижению фоновой активности ваго–инсулярной системы и синдрому «Пустота Инь»: плохая переносимость жары, теплые конечности, приливы жара к лицу, ночная потливость, сухость горла, тенденция к запору, желто-красная моча, красный язык без налета, пульс более 5 ударов за один цикл дыхания.

Во второй группе выявляются симптомы, соответствующие снижению фоновой активности симпато–адреналовой системы и синдрому «Пустота Ян»: плохая переносимость холода, холодные конечности, бледность лица, отеки, тенденция к жидкому стулу, учащенное мочеиспускание, светлая моча, язык бледный, отекший и влажный, пульс менее 5 ударов за один цикл дыхания.[6-7]

Обычно в первой группе встречаются больные, страдающие сахарным диабетом, гипертонической болезнью, стенокардией напряжения, хроническим активным гепатитом, хроническим гломерулонефритом, простатитом и др., а во второй – больные, страдающие болезнью Аддисона, бесплодием, импотенцией, гипотиреозом, апластической анемией, хроническим пиелонефритом и т.д

Больным первой группы можно периодически тонизировать точки JM-4 (Гуань Юань) и V-23 (Шэнь Шу), а в промежутках, с учетом специальных показаний, использовать отдельные лекарственные препараты: корень глении (*Radix Glehnie*), корень спаржи (*Radix Asparagi*), луковица лилии (*Bulbus Lilii*), плоды шелковицы белой (*Fructus Mori*), порошок из панциря черепахи (*Plastrum Testudinis*) или сложные лекарственные прописи: *Ba Xian Chang Shou Wan* – «пилюли, дающие бессмертие», *He Che Da Zao Wan* – «укрепляющие пилюли с женской плацентой».

Больным второй группы рекомендуется периодически прижигать точки JM-4 (Гуань Юань) и TM-4 (Мин Мэнь), а в промежутках, с учетом специальных показаний, использовать отдельные лекарственные препараты: молодые рога оленя (*Cornu Cervi Pantotrichum*), трава горянки крупноцветковой (*Herba Epimedii macrant*), ящерица гекко (*Gecko*), или сложные лекарственные прописи: *Gui Ling Ji* – «супертоник из коллекции времен древней черепахи», *Nan Bao* – «сокровище для мужчин», *Ge Jie Bu Shen Wan* – «пилюли с Гекко, тонизирующие почки»[1-3,5] и др.

Таким образом, традиционная восточная фармакология может использоваться как для повышения эффективности КВЧ-терапии, так и между курсами КВЧ-терапии с целью профилактики рецидива заболевания.

В настоящее время некоторые патентованные препараты можно приобрести в специализированных отделах обычных аптек. Ниже приводятся некоторые готовые лекарственные формы, поставляемые фирмой «Гринвуд»[8] из КНР и СРВ:

1. Бо Тхан Ам – тонизирует «Инь Почек и Кровь» – применяется при наличии следующих симптомов: головокружение, ощущение жара, анемия, шум в ушах, темная моча, боли в спине;
2. Ха Ша Дай Тао – лекарство с женской плацентой, тонизирующее «Инь и Кровь» – применяется при наличии синдрома «Пустота Инь», в частности, при тяжелом климаксе, для восстановление организма после длительного и тяжелого заболевания, а также с целью продления жизни.
3. Бо Тхан Зыонг и Нан Бао – тонизируют «Ян Почек» – применяются при наличии различных симптомов, характерных для Пустоты Ян, включая: головокружение, энурез, преждевременная эякуляция, поллюции, шум в ушах, боли в спине, зябкость;
4. Ха Шам – применяется при истощении, бессоннице, выпадении волос, ранней седине и других проявлениях Пустоты Почек;
5. Бо Шам – тонизирует и согревает Селезенку и Средний обогреватель – применяется для лечения различных нарушений пищеварения с симптомами Пустоты Ян Qi, Желудка и Селезенки;
6. Бак Лонг [«Белый дракон»] и Фэ Хоан, – применяются при болезнях «Ветра и Холода», т.е. при простудных заболевания лёгких и бронхов, включая хронический бронхит, пневмонию, бронхиальную астму, ОРЗ, тонзиллит, и др.;
7. Ким Лонг [«Золотой дракон»] и Лин Дон – применяются при болезнях «Ветра и Жара», т.е. при воспалительных и аллергических заболеваниях верхних дыхательных путей;
8. «Благо» – растворимый потогонный чай – используется при остром заболевании простудного характера, т.е. для лечения первого уровня (Tai Yang) по теории 6-ти каналов; [4]
9. Сик Лонг [«Красный дракон»], Ик Мау Хоан, Нгок Ну Хоан, «Женское совершенство», Шам Нунг Дай Бо – группа препаратов, применяющихся при синдроме «Пустоты Крови» и заболеваниях, связанных с женской половой сферой. Отмечено, что большинство лекарств, тонизирующих «кровь», оказывают омолаживающий эффект.
10. Мок Лонг [«Древесный дракон»], Тэу Хоан и Шат Док Хоан – «очищают Жару Печени» – применяются при гепатите и циррозе печени, а также при различных зудящих дерматозах, включая нейродермит, экзему, псориаз и др.
11. Хо Нгой Лон, Хо Тре Ем и Бак Лонг – отхаркивающие препараты в виде эликсиров.

Некоторые компоненты фармакопеи ТКМ доступны в России и имеют синдромное описание, например:

Плоды фенхеля обыкновенного (*Foeniculum vulgaris Mill.*) характеризуются как «теплые» по качеству, «острые» по вкусу и имеющие тропность к каналам Печени, Почек, Селезенки и Желудка. Они «согревают и рассеивают Холод», «уменьшают боль», «регулируют Qi и гармонизируют Желудок». Плоды фенхеля применяются при различных заболеваниях органов пищеварения с симптомами «Холода», а именно, при болях в животе, нарушении пищеварения, снижении аппетита, при тошноте, рвоте и т.д.[1]

Трава мяты перечной (*Mentha haplocalyx Briq*. или *Mentha arvensis L.*) характеризуются как «холодная» по качеству, «острая и душистая» по вкусу и имеющая тропность к каналам Легких и Печени. «Рассеивает Ветер-Жар», «очищает голову и глаза», «улучшает движение Qi Печени» и «ускоряет появление сыпи при инфекционных заболеваниях». Обычно применяется при следующих симптомах: лихорадка, головная боль, кашель, боли в горле, красные глаза, ощущение распирания и полноты в груди, в области ребер и в боках, эмоциональная лабильность, некоторые инфекционные и гинекологические заболевания.[1]

Отвар из порошка гипса (*сульфат кальция*) характеризуется как «очень холодный» по качеству, «сладкий и острый» по вкусу и имеющий тропность к каналам Легких и Желудка. «Очищает Полноту Легких, вызванную Жаром» и «ослабляет Огонь Желудка». Применяется при поражении 3-го уровня (Yang Ming) с симптомами: лихорадка, ощущением жара (без озноба), возбуждение, выраженная жажда, профузный пот, красный язык с желтым налетом.[4] Кроме того, гипс эффективен при следующих симптомах «жары»: шумное дыхание с хрипами и кашель с отделением густой, вязкой мокроты, головная боль, болезненное воспаление десен, экзема, термические ожоги кожи и др.[1] .

Моча мальчика до 10 лет «увлажняет Инь» и «устраняет Жару»[9] - применяется внутрь при синдромах «Жары-Сухости» с такими симптомами, как сухой надсадный кашель, кровохарканье, бронхиальная астма, запор, синдром Шегрена и др.

Список патентованных препаратов ТКМ и отдельных трав, доступных в России, значительно шире. Некоторые из них поставляются в виде пищевых добавок, другие продаются как специи или пряности.

Несмотря на тенденцию к интеграции Востока и Запада, необходимо обратить внимание на различия между «традиционной восточной» и «современной западной» медицинскими системами. Используя традиционные восточные принципы диагностики, врач не может поставить современный нозологический диагноз и провести адекватную терапию современными методами. Общепринятые методы современной диагностики не позволяют поставить синдромный диагноз ТКМ и назначить соответствующее лечение методами и средствами ТКМ. Использование современных критериев постановки нозологического диагноза потребует назначение современных медикаментов. Постановка синдромного диагноза ТКМ позволяет использовать синдромные лекарственные препараты ТКМ наряду с иглоукалыванием, прижиганием или КВЧ-пунктурой.

Максимальный терапевтический эффект препаратов традиционной восточной фармакологии может быть достигнут лишь при понимании их синдромной характеристики. Попытка описывать действие традиционных восточных препаратов языком современной фармакологии приводит к искажению показаний, затрудняет комбинированное использование и, как следствие, снижает эффективность лечения.

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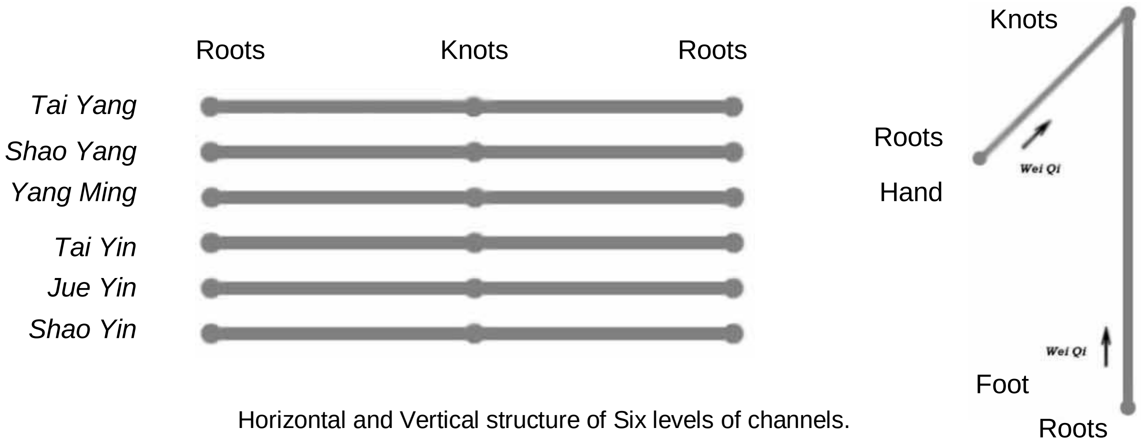
The Theory of «Roots & Knots» (Lin Shu, Chapter 5): A New Version of the Subject

Mikhail Teppone, Romen Avakyan

The 5th International Baltic Congress on Medical Acupuncture and Related Techniques
Jurmala, May 28-31, 1998, p. 55-56

To fulfill the defensive function against the Exogenous Pathogenic Factors, the Regular Channels are coupled according to the Yang-Yang and Yin-Yin principle, realizing the «Upper-Lower» connections. The pairs of channels are disposed at various depths relative to the skin layers.



Horizontal and Vertical structure of Six levels of channels.

Level or pair of Channels	«Root» Points of the Hand Channels	«Root» Points of the Foot Channels	«Knot» Points
Tai Yang	SI-1 (Shao Ze)	B-67 (Zhi Yin)	B-1 (Jing Ming)
Shao Yang	SJ-1 (Guan Chong)	Gb-44 (Zu Qiao Yin)	SI-19 (Ting Gong)
Yang Ming	LI-1 (Shang Yang)	St-45 (Li Dui)	St-8 (Tou Wei)
Tai Yin	L-11 (Shao Shang)	Sp-1 (Yin Bai)	Ren-12 (Zhong Wan)
Shao Yin	H-9 (Shao Chong)	K-1 (Yong Quan)	Ren-23 (Lian Quan)
Jue Yin	Pc-9 (Zhong Chong)	Liv-1 (Da Dun)	Ren-18 (Yu Tang)

Defensive function of the levels is realized by the normal (fluent) circulation of Defensive Qi (Wei Qi) between the layers from *Tai Yang* outside towards *Jue Yin* and *Shao Yin* inside and upwards from «Root» to «Knot» points.

1-st level	*Tai Yang*	Bladder and Small Intestine
2-nd level	*Shao Yang*	Gallbladder and Triple Burner
3-rd level	*Yang Ming*	Stomach and Large Intestine
4-th level	*Tai Yin*	Spleen and Lung
5-th level	*Shao Yin*	Kidney and Heart
6-th level	*Jue Yin*	Liver and Pericardium

Diseases originating in the level or layer system are caused by invasion of «extreme pathogenic energies» (Evil Qi), i.e. those which are not specific for the particular season. This extreme Evil Qi do not invade the Regular Channels or Organs but affect the Collaterals causing thus the «strange diseases». Except the clinical manifestations of affected Collaterals there are symptoms of Qi circulation disturbance in the affected layer.

Levels	Symptoms of Levels
Tai Yang	Diseases originate on the body surface: - pain syndromes are distinctly expressed; - due to reduced protection reserves, the organism is highly vulnerable to various diseases; - thinned skin and muscles of patient are notable in external examination
Shao Yang	Yang Qi circulation is disturbed which gives stagnation of pathogenic Qi: - muscles and joints are weakened and painful; - the patient is unable to assume a vertical position and run.
Yang Ming	Defensive Yang Qi is blocked and does not penetrate inside the body: - muscle weakness is increased, limbs become powerless; - there appear paralyses.
Tai Yin	Stomach Defensive Yang Qi may not penetrate deep and feed Zang Organs: - Qi and food transportation to the organs is disturbed; - symptoms of reduced energy are present, including violent diarrhea; - Zang Organs are blocked with symptoms such as abdominal distension and pains in the epigastria region.
Shao Yin	Level does not close Yin inside: - Wei Qi is extremely deficient; - the patient permanently sighs and moans.
Jue Yin	Connection between the Yin channels is disturbed: - energy flood is reduced, stagnation exist, accompanied by symptoms such as general weakness, difficult labor and short breath in a rest position; - tendency to depression and mental diseases.

The aim of treatment of such syndromes is to restore the normal circulation of Defensive Energy (Wei Qi, or Yang Qi) both along the channels from «Roots» to «Knot» points, and between the layers. The affected channel must be «opened», i.e. reinforced in case of Deficiency and sedated in case of Excess.

The Deficiency is caused by the lack of Defensive Energy (Wei Qi), therefore «Knot» and «Roots» points should be reinforced. When acupuncture is used, the needling should be shallow to prevent the penetration of Exogenous Factor into deeper parts of organism.

Excess is caused by the Exogenous Factor which should be dispersed in the same points.

Affection of some level is usually accompanied by symptoms of Collaterals affection, including the Extra Channels. Thus the 3 Yin Channels affection is combined with *Ren Mai*; while Shao Yin affection is related with the entire *Yin Wei Mai*; Shao Yang and Yang Ming may combine with *Dai Mai*, while Tai Yang is related with *Yang Jiao Mai*, etc.

In this case one should combine treatment of levels with treatment of exact secondary vessels.

In classic Chinese books *Shao Yin* Channels are on the 5th level, and *Jue Yin* Channels are on the 6th level. But in the book of A. Chamfrault, N.V. Nghi, and some other experts, *Shao Yin* Channels are on the 6th level and *Jue Yin* Channels are on the 5th level [Chamfrault A., Nghi N.V., Traite de Medecine Chinoise: L'Energetique Humaine en Medecine Chinoise. — Coquemard, Angoulкme, 1969, V 6, 463 p].

The Modern Aspects of EHF-Puncture: Workshop

M.Teppone, R.Avagyan

The 5th International Baltic Congress on Medical Acupuncture and Related Techniques
Jurmala, May 28-31, 1998, abstract book, p. 56
https://archive.org/details/modern-aspects-of-ehf-puncture

EHF-Puncture:

The EHF-Puncture applies low intensity electromagnetic radiation (EMR) of millimeter (MM) band. On the EMR spectrum, EHF resides between centimeter radio waves and infrared waves and includes frequencies from 30 to 300 GHz or wavelengths from 10 to 1 mm. In clinical practice the usual applied power of this radiation is 1.0-0.001 mW and less. The combination of different biological effects of MM EMR and acupuncture theory of TCM resulted in the procedure known as Extremely High Frequency (EHF) - Puncture.

Peculiarities: EHF-Puncture proclaims the same principles as traditional Acupuncture and Moxibustion but nevertheless has some peculiarities: EHF-Puncture is non-invasive, so there is no problem of sterilization of instruments or danger of bacteria or viruses transmission from one patient to another; painless; universal: MM EMR can be used to treat "Deficiency" or "Excess", "Heat" or "Cold" syndromes, the type of response depends on the initial condition of the patient and the exposure time depends on responses of the patient; EHF-Puncture permits one and the same acupoint to be "tonified" or "dispersed" several times during the same procedure; can stimulate different kinds of "Arrival of Qi phenomenon" without needle manipulation, sensory reactions may even be observed in paralyzed extremities of spinal trauma patients: MM waves can stimulate specific sensory reactions (phenomenon De Qi) not only at the place of influence but at the place of Qi-disorders directly: so, one may apply it to influence on the corporal traditional acupoints as well as points of different microsystems: Ear, Palm, Soul, Pulse points, Nose, etc.

Devices for EHF-Puncture: A series of "Artsakh" devices intended for EHF-Puncture therapy is based on a solid state MM generator with a microprocessor managing system and provide three radiation modes: coherent (at the frequencies of absorption lines of oxygen or water vapour: 60.0; 118.0 and 184.0 GHz), "noise" (42-95 and 90-160 GHz) and combined. It is possible to adjust output power, internal amplitude modulation (1-200 Hz) and exposure time. The generator head of each device may be provided with infrared or colour radiation.

Diagnostic Devices: A special diagnostic device called "ACUVISION" has been developed for the purposes of testing the functional status of the patients' acupoints and channels. This device visualizes acupoints with low electrical resistance by means of illumination in a high-voltage corona discharge field. Intensity of illumination and relaxation time can be used as criteria of "Excess" syndrome at certain acupoints and channels. "ACUVISION" visualizes acupoints on human or animal skin as well as on the surface of plants..

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Keywords: Acupuncture, Luo vessels, Tendinomuscular channels, Divergent channels, general adaptation syndrome, Hans Selye, pulmonary hypertension, cold feet, trophic disorders, keloids, paralysis, bedsores, crepitus, diabetes, pruritus, eczema, bald spots, trophic ulcer, contusions, constipation, urinary retention

CLINICAL HYPOTHESES

Luo Vessels (Collaterals): A New Perspective

Mikhail Teppone, Larisa Novikova
Coloyaro Limited
6 Eizenshteina Strasse, No. 144
Moscow 126229, Russia

Abstract: The authors offer a new perspective on the trajectory, function and pathology of the Luo vessels (collaterals): (a) Every Luo vessel is comprised of two branches: one proceeds proximally from the Luo point, and the second proceeds distally; (b) the interrelation between the vascular system and Luo vessels is elaborated; (c) syndromes characterized as Excess correspond to vascular (arterial or venous) pathology; (d) Deficiency syndromes correspond with disorders involving microcirculation or innervation of different tissues. Included are various criteria for differentiation and recommendations for the consideration of Luo vessels in treatment.

THE theory of channels and collaterals (Jing-Luo) is one of the most ancient and fundamental concepts of Chinese acupuncture; it continues to intrigue and challenge modern acupuncturists.

I. Theoretic Considerations

According to Jing-Luo theory, the Luo vessels are secondary pathways that branch off from their related Primary channels (see Figure 1). There are 15 Luo vessels, including the 12 Luo that branch from each of the twelve Primary channels, the Ren and Du Extra vessels, and the Great Luo of the Spleen.[1-5]

These Luo vessels are distributed superficially over the four limbs, head, and the anterior, posterior and lateral aspects of the body. They primarily connect the channels of the yin-yang (internal-external) related organ pairs, protect and strengthen the function of the twelve Primary channels, and also assist the transportation and distribution of Qi and Blood, which moisten and nourish the whole body.[1-5] Functioning also as a type of safety valve, the Luo vessels provide a means by which an excess of energy in one channel may be "drained off" into, or a relative deficit may be "replenished" from, its paired organ.[6]

However, the traditional descriptions of the trajectory, function and pathology of the Luo vessels raise many questions, and therefore may prevent their effective appli-

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Please address all correspondence and reprint requests to: Mikhail Teppone, 6 Eizenshteina Strasse, No. 144, Moscow 126229, Russia.

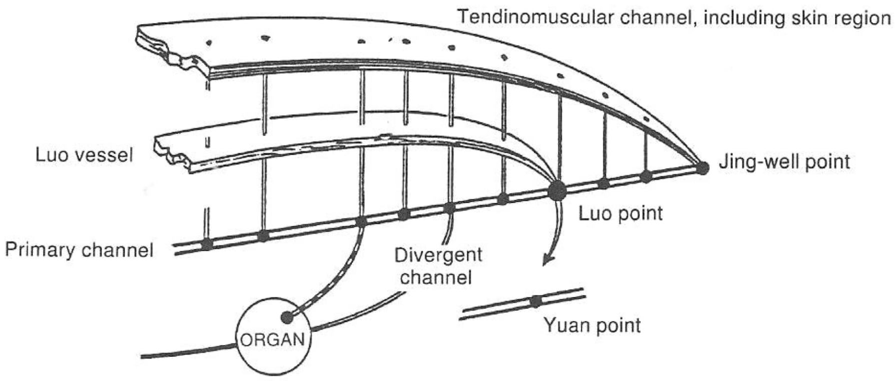
Tendinomuscular channel, including skin region
Luo vessel
Jing-well point
Luo point
Primary channel
Divergent channel
Yuan point
ORGAN

Figure 1.
Conventional representation of a Primary channel and its corresponding
Luo vessel, Tendinomuscular and Divergent channels

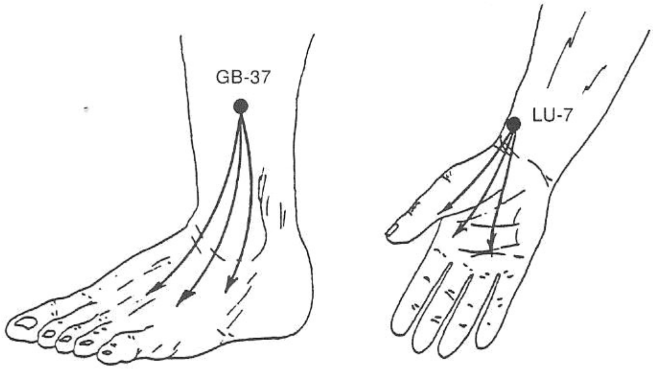

Figure 2.
Conventional representation of the paths of the Luo vessels of
the Gallbladder and Lung vessels

cation in clinical practice. Consider, for example:

1. According to the conventional understanding, why do the paths of the Luo vessels of the Lung and Gallbladder proceed distally, whereas the Luo of other channels proceed proximally? (see Figure 2)
2. Why is it that clinical manifestations may not directly relate to the pathway of the local Luo vessel?
3. Why, for example, does Excess of the Lung Luo manifest "heat in the wrist or palm," whereas Excess of the Gallbladder Luo manifests "coldness in the feet"?
4. How can the same clinical manifestations (pain, pruritus, etc.) be differentiated in disorders of the Primary, Tendinomuscular, and Luo vessels?

This article will attempt to offer a new perspective regarding different aspects of the Luo vessels that may help to answer unresolved questions and assist in their pracical use.

A. *New Perspective on Trajectories of the Luo Vessels*

We contend that every Luo vessel is comprised of at least two branches, each originating at the related Luo point. One branch proceeds along the proximal portion of the Primary channel, and the second branch proceeds distally along the distal portion of the Primary channel.

Therefore, while the deep pathway of a Divergent channel7 is very similar to the deep pathway of its related Primary channel, the pathway of a Luo vessel is longer and traverses the full length of the pathway of its related Primary channels.

The Ling Shu (chapter 66) characterizes the yang Luo vessels as "opening" to the exterior, but yin Luo vessels "opening" to the interior.2 Very likely, this statement is correct for the proximal branch of the Luo. According to our working hypothesis, the converse would be the case for the distal branch, i.e., yang Luo vessels "opening" to the interior and yin Luo vessels "opening" to the exterior.

We propose that Luo points are:

a. The location where a Luo vessel *crosses* a yang Primary channel from a proximal superficial level to a distal deeper level; and
b. Where a Luo crosses a yin Primary channel from a proximal deeper level to a distal superficial level (see Figure 3). In this manner, the Luo vessels proceed along the entire pathway of the Primary channel.

The question arises: Why would only one branch, the proximal, have been described in traditional sources? Possibly, because the proximal branch was damaged more frequently, or because the trajectory of this branch was not clearly distinguished from the trajectory of the Primary channel. Considering this, it would be understandable why clinical manifestations may sometimes not clearly relate to the trajectory usually described for that Luo vessel.

B. *Clinical Manifestations: Syndromes of Excess and Deficiency*

As described above, the Luo vessels strengthen the relation between each pair of yin-yang (internal-external) related channels as well as transport Qi and Blood to various tissues and organs of the human body.[1-5] Disorders of the Luo vessels consist of symptoms corresponding to blockages of Qi and Blood. Some symptoms can be differentiated as Excess or Deficiency, but others can indicate a blockage of a specific Luo vessel. For example, blockage of the

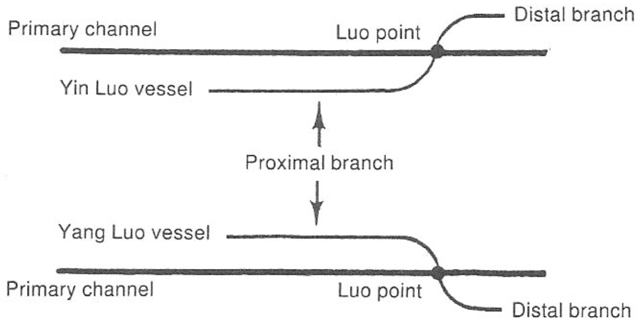
Primary channel
Luo point
Distal branch
Yin Luo vessel
Proximal branch
Yang Luo vessel
Primary channel
Luo point
Distal branch

Figure 3.
Proposed representation of the proximal and distal branches of Yin and Yang Luo vessels

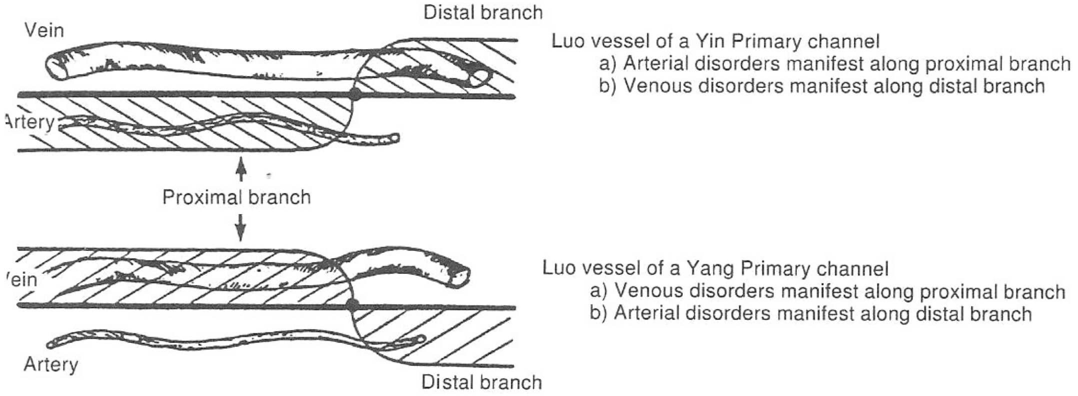
Distal branch
Vein
Luo vessel of a Yin Primary channel
a) Arterial disorders manifest along proximal branch
b) Venous disorders manifest along distal branch
Artery
Proximal branch
Luo vessel of a Yang Primary channel
a) Venous disorders manifest along proximal branch
b) Arterial disorders manifest along distal branch
Artery
Distal branch

Figure 4.
Areas of influence of the proximal and distal branches of Yin and Yang Luo vessels and their correspondence to the vascular system

Table 1.
Syndromes of Excess Luo Vessels (Collaterals)

Collateral	Proximal Branches	Distal Branches
Yang	Venous disorders	Arterial disorders
Yin	Arterial disorders	Venous disorders

Spleen Luo manifests "cholera" with vomiting and diarrhea; however, Excess of the Spleen Luo manifests severe abdominal pain, and Deficiency manifests fullness in the abdomen "like a drum."[1-5]

We will analyze Excess and Deficiency from the perspectives of physiologic function, specifically, the general and local adaptation syndromes.

In order to survive, when an organism encounters any adverse factor that disturbs its homeostasis, the organism initiates what Canadian physiologist Hans Selye termed the "general adaptation syndrome" (GAS).[8-10] The GAS involves vasoregulatory and endocrine mechanisms. Selye described three phases of adaptation: (1) alarm, (2) resistance, (3) exhaustion.

In order for successful adaptation to proceed, activation of the sympathetic nervous system (SNS) must be greater than activation of the parasympathetic nervous system (PNS). These two divisions of the autonomic nervous system function as paired antagonists.

The *resistance phase* usually presents without clinical manifestations. However, the various symptoms manifested in the *alarm phase* are characterized primarily by an increase of SNS activity, with high blood levels of hormones, including corticoids, etc. The *exhaustion phase* is characterized by a decrease of PNS activity and lower levels of some hormones, including insulin.[8,9]

The alarm phase is very active and corresponds to the Chinese concept of an Excess syndrome. The exhaustion phase manifests low energy and corresponds to a Deficiency syndrome.

Whereas the general adaptation syndrome is a response of the organism as a whole, the local adaptation syndrome is the response of a specific organ, tissue or cells and involves principles similar to the GAS.

C. Excess Syndromes of the Luo Vessels

According to Jing-Luo theory, Luo vessels transport Qi and Blood, which may be in Excess or Deficiency. Within the region of these Luo vessels, the vascular anatomy includes veins that are distributed superficial to arteries. Our observations have led us to propose that in the presence of an Excess syndrome and high SNS activity, vascular pathology may be present. Specifically, we suggest the following schema of four possibilities: (see Figure 4 and Table 1):

1. Excess syndromes of the proximal branches of a Yang Luo involve venous disorders;
2. Excess syndromes of the distal branches of a Yang Luo involve arterial disorders.
3. Excess syndromes of the proximal branches of a Yin Luo involve arterial disorders;
4. Excess syndromes of the distal branches of a Yin Luo involve venous disorders.

For example, in addition to the classical indications of Excess at the *proximal* branch of the Stomach Luo (Yang) including "men-

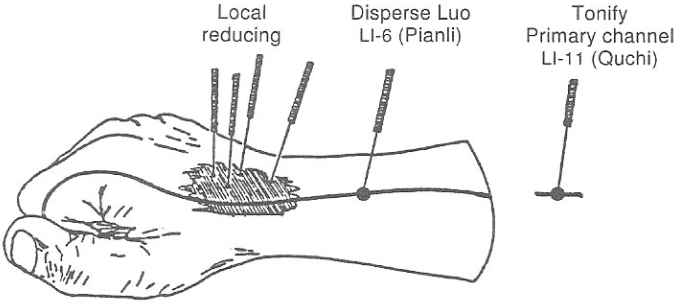
Local
reducing
Disperse Luo
LI-6 (Pianli)
Tonify
Primary channel
LI-11 (Quchi)

Figure 5.
Case 1: Treatment for Excess of the Tendinomuscular channel and Excess of Luo vessel of the Large Intestine

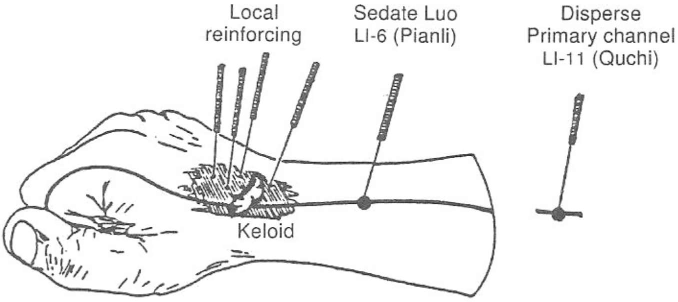
Local
reinforcing
Sedate Luo
LI-6 (Pianli)
Disperse
Primary channel
LI-11 (Quchi)
Keloid

Figure 6.
Case 2: Treatment for Deficiency of the Tendinomuscular channel and Excess of Luo vessel of the Large Intestine

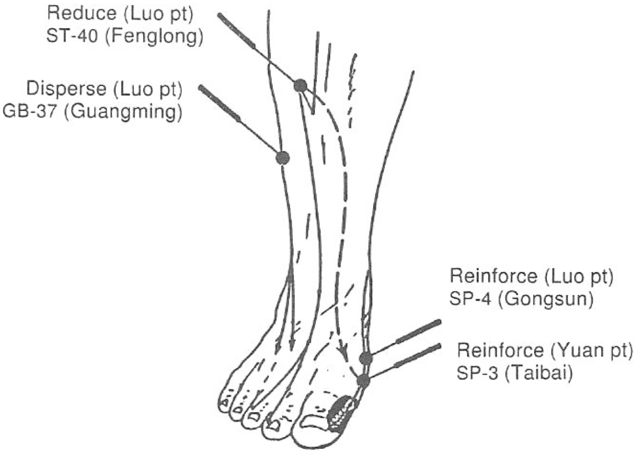
Reduce (Luo pt)
ST-40 (Fenglong)
Disperse (Luo pt)
GB-37 (Guangming)
Reinforce (Luo pt)
SP-4 (Gongsun)
Reinforce (Yuan pt)
SP-3 (Taibai)

Figure 7.
Case 4: Treatment of a trophic ulcer of the big toe

Table 2.
Differential diagnosis of Luo vessels and Tendinomuscular channel disorders

Differential	Tendinomuscular Channels	Luo Vessels
Depth of disturbance(s)	–Superficial or relatively mild character of the disturbances; –With no symptoms of organ involvement	–Disturbances may be both superficial and deep (serious), including psychological or mental disorders (for example, excess in the Stomach Luo)
Pain	–Usually Excess syndrome, but may also be Deficiency of tendinomuscular channel; –Usually accompanied by altered skin sensitivity and other inflammatory features, but without skin pattern alterations (such as scars or atrophy); –Relieved or aggravated by pressure	–Usually Excess syndrome, but may also be Deficiency of Luo; –Pain is not accompanied by a change of skin sensitivity, although numbness and skin pattern alterations are possible; –Relieved or aggravated by movement
Skin Itch	–Relieved by light scratching; caused by Wei Qi deficiency	–May cause vigorous scratching, often to the extent of drawing blood and leaving markings; caused by Blood and Qi deficiency
Treatment	–Local therapy of the affected area is required; –Acupuncture, moxibustion, massage, etc.	–Local therapy is inefficient, Luo and Yuan points should usually be used; –Acupuncture, moxibustion and chiropractic is applicable

tal disorders and/or epilepsy," we propose that one might also find Blood stagnation in the venous system such as insufficient venous drainage from the brain and other organs of the head and neck.

Excess at the *distal* branch of the Gallbladder Luo (Yang), associated with symptoms of "coldness in the feet," might also present with arterial blockage such as insufficient arterial supply to the lower extremities due to atherosclerosis or thrombosis.

Excess syndromes involving the *proximal* branch of the Spleen Luo (Yin), associated with severe abdominal pain, might include arterial disorders, e.g., resembling symptoms found in thrombosis of the mesenteric artery.

And, excess at the distal branch of the Lung Luo (Yin), associated with "sensations of heat in the wrist and palm," manifesting due to venous dilatation.

Certainly, we aren't suggesting that all syndromes of Excess are characterized by vascular disorders. Various symptoms are well known and reported.[1-5] Nevertheless, the above perspective shows some correspondence with traditional Chinese diagnosis and some aspects of modern Western medicine.

Expanding on this concept, the clinical applications begin to emerge. For example: "coldness in the feet" could be attributed not only to Excess of the Gallbladder (Yang) Luo, but also to Excess of the Stomach (Yang) or Bladder (Yang) Luo vessels.

Let's take these concepts one step further and consider a patient with a known Western diagnosis of hypertension involving the pulmonary artery, i.e., pulmonary hypertension. Per our hypothesis, because this is an arterial disorder, there would be involvement of an Excess of the proximal branch of the Lung (Yin) Luo vessel. Accordingly, the Luo point of the Lung [Yin] channel (LU-7: Lieque) should be dispersed.

D. Deficiency Syndromes of the Luo Vessels

In the exhaustion phase of GAS, depleted stores of glucocorticoids prevent cells from obtaining extra sugar, nutrients and minerals they need to cope. These factors alter cellular metabolism, thus placing a greater load on the circulatory, GI, nervous, and immune systems; virtually every part of the body. As a result they predispose to various "trophic" disorders including muscular atrophy and weakness of the lower extremities (Stomach Luo), weak and flaccid muscles of the lower limbs and inability to stand from a sitting position (Gallbladder Luo), pruritus of the skin (Liver and Ren Luo vessels), abdominal symptoms including distention (Spleen Luo), and weakness in the joints of the extremities (Great Luo of the Spleen).[2-5]

One may attempt to differentiate Yang from Yin, SNS from PNS generated disorders (for example, dry or humid gangrene), but for practical application it is not necessary.

Trophic disorders of the skin can include the following: regional pruritus, neurodermatitis, eczema, bald spots, trophic ulcer, bedsores, etc. (Hyperplasia of the skin, including keloids, pertains to an Excess syndrome of the Luo traversing the affected region).

Trophic disorders of the musculature include weakness, partial or complete paralysis with muscular atrophy, torticollis, etc.

Trophic disorders of the joints include weakness, flaccidity, habitual dislocation, joint crepitus, slippage of vertebral body, etc.

Degeneration or atrophy of an organ or tissue also can be described as a Deficiency of the related Luo.

E. The Differential Diagnosis of Disorders Involving Luo Vessels & Tendinomuscular Channels

Excess or Deficiency syndromes of the Luo vessels and tendinomuscular channels may present with similar clinical manifestations. Therefore, differential diagnostics is required for these two groups of syndromes. We will consider only a few common symptoms, which one usually needs to differentiate (see Table 2).

To diagnose a particular case, in addition to the usual examinations (palpation of the peripheral pulse, observation of the color and pattern of the skin, etc.), the practitioner should also palpate the affected region and Luo point, plus observe other signs such as posture, flaccidity, flexion or extension of involved limbs or joints, etc.

II. Treatment

According to Jing-Luo theory, the therapeutic principle is to reduce an Excess and to increase a Deficiency. Generally, for either an Excess or Deficiency of a Luo, one should select the corresponding Luo point and treat accordingly.[2]

However, in practice, treatment must also address variations related to the source of the disturbance, that is, Exogenous and Endogenous factors.[5]

1) Exogenous Factors

Excess Syndrome: Disperse the Luo point of the affected channel.

Deficiency Syndrome: According to Nguyen Van Nghi, Exogenous factors accumulate at the Yuan-point of the affected (or aberrant) channel. This point should be dispersed. However, this dispersion also results in reducing the Luo point of the paired Yin-Yang channel. In order to preserve the integrity of the (more normal) paired channel, its Luo point should be tonified.[5]

Certainly, if there are disorders within other systems or tissues, they will additionally need special treatment. For example, if there is Deficiency of the Luo of one side, the practitioner may be almost certain that there is a disorder at the Divergent channel on the other side.

2) Endogenous Factors

If Excess or Deficiency of the Luo is a result of deeper Excess or Deficiency at the Primary channel or at the Organ, it will be necessary to treat the Primary reason first, and then the Luo.

III. Clinical Examples

Case 1: Luo Vessel Excess

Symptoms: Contusion of the back of the wrist with pain and swelling. Pain aggravated by pressure and extension.

Diagnosis: Excess of the Tendinomuscular channel and Luo vessel of the Large Intestine.

Treatment: Disperse the affected region locally and Luo point of the Large Intestine, LI-6 (Pianli). Additionally, the Primary (Large Intestine) channel should be tonified via acupoint LI-11 (Quchi) (see Figure 5).

Case 2: Luo Vessel Excess

Symptoms: Contusion of the back of the wrist followed by formation of a keloid; chronic dull pain, relieved by local heat and massage, but aggravated by extension of the wrist. There was a loss of sensation and thinning in the vicinity of the scar, and the skin remained intact.

Diagnosis: Deficiency in the Large Intestine Tendinomuscular channel; Excess in the Luo of the Large Intestine channel.

Treatment: Locally tonify the Deficient area of the Large Intestine Tendinomuscular channel with moxibustion or acupuncture via superficial needling. Exogenous disturbances should be dispersed via the He ("Sea") point LI-11 (Quchi) of the Large Intestine Primary channel; sedation of the Large Intestine Luo should be done through the Luo point LI-6, (Pianli) (see Figure 6).

Comment: Injury is equivalent to transformation of "kinetic energy" into Heat Qi. Any moving body has kinetic energy, which correlates with its mass and speed. If this moving body is suddenly stopped, kinetic energy changes into heat/Heat, one of the Six Exogenous factors.

Case 3: Luo Vessel Deficiency and Excess

Symptoms: Patients with injury to the vertebral column may often have paralysis of the lower (and upper) extremities, bedsores at the sacral region, hyperkeratosis of the soles of the feet, constipation and retention of urine.

Diagnosis: Bedsores and paralysis due to Deficiency of the Bladder Luo and damage of Du and Dai Extra vessels; hyperkeratosis, genitourinary symptoms due to Excess of the Kidney Luo.

Treatment: To improve trophic processes in the paralyzed extremities, tonify the Yuan point of the Bladder channel (BL-64: Jinggu) and disperse the Luo point of the Kidney channel (K-4: Dazhong) to restore balance between Yin-Yang paired channels.

Case 4: Luo Vessel Deficiency and Excess

Symptoms: Ulcer of the large toe, cold feet and diabetes mellitus (Middle Jiao type).

Diagnosis: Ulceration of the large toe is a symptom of Spleen Luo Deficiency. However, cold feet indicate Excess of the Stomach or Gallbladder Luo vessels. Since there were no signs of Gallbladder channel disorders, one may suppose that there is an Excess of the Gallbladder Luo vessel, caused by entry and lodging of the Exogenous factor, and/or blockage of the descending branch of the Chong Extra vessel.

This patient's other symptoms suggested a Deficiency of Yin (Kidney Yin), Excess of the Stomach (Organ), and Deficiency of the Spleen (Organ) as a result of imbalance between Yin-Yang related Organs and channels.

Treatment:

a. Strengthen Yin by means of herbs and acupuncture.
b. Harmonize the Stomach and Spleen: Reduce the Luo point of the Stomach (ST-40: Fenglong) and reinforce the Yuan point of the Spleen (SP-3: Taibai).
c. Strengthen the Spleen Luo: Reinforce the Luo point of the Spleen (SP-4: Gongsun); this will also serve to resolve blockage of the descending branch of the Chong Mai. [Note: The Confluent point of the Chong Extra vessel and the Luo point of the Spleen are the same: Gongsun].
d. Disperse the Gallbladder Luo: Disperse the Luo point of the Gallbladder (GB-37: Guangming). (see Figure 7)

IV. Conclusion

Certainly, it is not possible to consider all aspects of this vast subject, nevertheless we hope that this new perspective on the Luo system will enable practitioners to apply more effective treatments and to extend therapeutic horizons.

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Методики КВЧ-терапии

М.Теппоне, Р.Авакян

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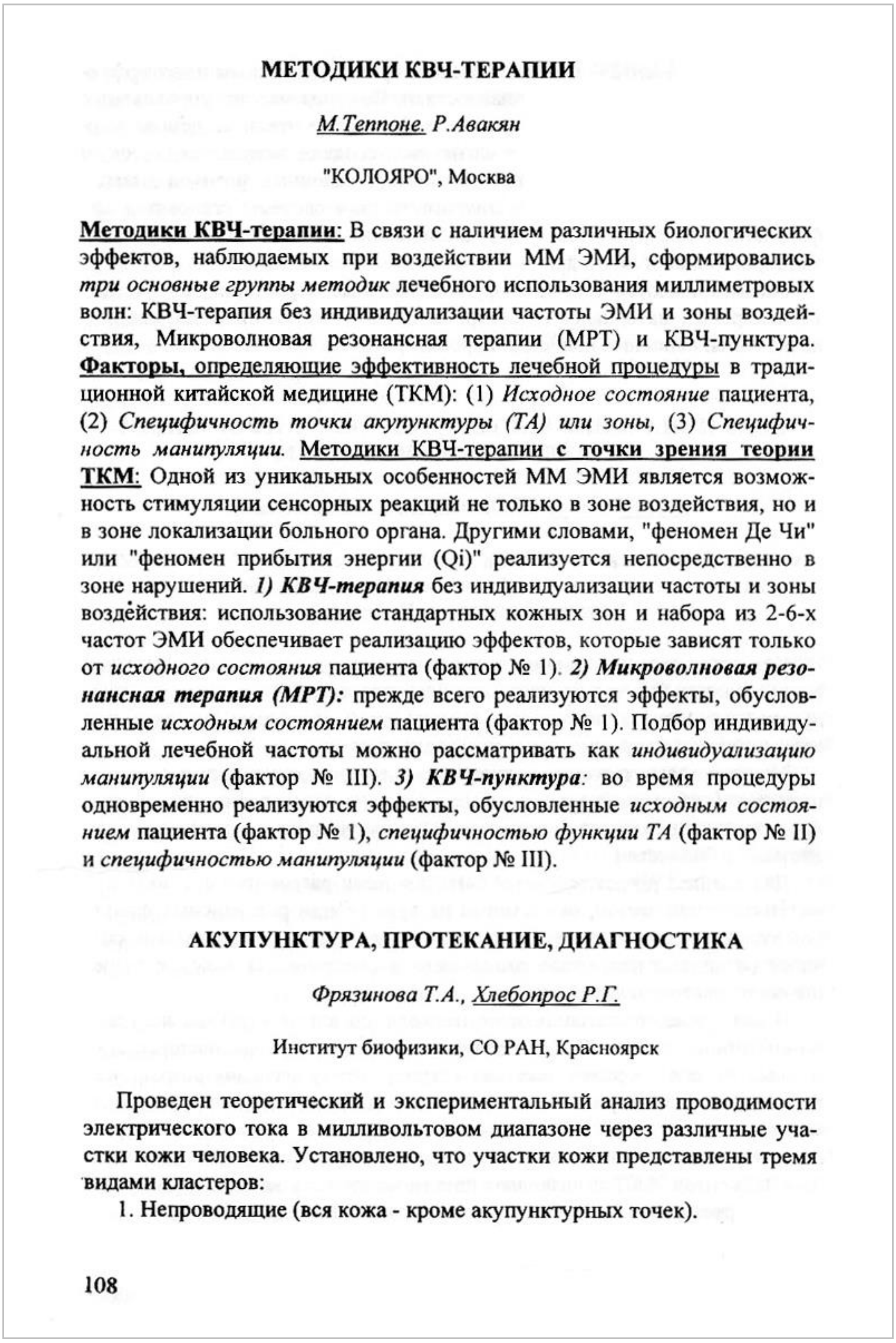

МЕТОДИКИ КВЧ-ТЕРАПИИ

М.Теппоне, Р.Авакян

"КОЛОЯРО", Москва

Методики КВЧ-терапии: В связи с наличием различных биологических эффектов, наблюдаемых при воздействии ММ ЭМИ, сформировались *три основные группы методик* лечебного использования миллиметровых волн: КВЧ-терапия без индивидуализации частоты ЭМИ и зоны воздействия, Микроволновая резонансная терапии (МРТ) и КВЧ-пунктура. **Факторы,** определяющие эффективность лечебной процедуры в традиционной китайской медицине (ТКМ): (1) *Исходное состояние* пациента, (2) *Специфичность точки акупунктуры (ТА) или зоны,* (3) *Специфичность манипуляции.* Методики КВЧ-терапии с точки зрения теории ТКМ: Одной из уникальных особенностей ММ ЭМИ является возможность стимуляции сенсорных реакций не только в зоне воздействия, но и в зоне локализации больного органа. Другими словами, "феномен Де Чи" или "феномен прибытия энергии (Qi)" реализуется непосредственно в зоне нарушений. ***1) КВЧ-терапия*** без индивидуализации частоты и зоны воздействия: использование стандартных кожных зон и набора из 2-6-х частот ЭМИ обеспечивает реализацию эффектов, которые зависят только от *исходного состояния* пациента (фактор № 1). ***2) Микроволновая резонансная терапия (МРТ):*** прежде всего реализуются эффекты, обусловленные *исходным состоянием* пациента (фактор № 1). Подбор индивидуальной лечебной частоты можно рассматривать как *индивидуализацию манипуляции* (фактор № III). ***3) КВЧ-пунктура***: во время процедуры одновременно реализуются эффекты, обусловленные *исходным состоянием* пациента (фактор № 1), *специфичностью функции ТА* (фактор № II) и *специфичностью манипуляции* (фактор № III).

АКУПУНКТУРА, ПРОТЕКАНИЕ, ДИАГНОСТИКА

Фрязинова Т.А., Хлебопрос Р.Г.

Институт биофизики, СО РАН, Красноярск

Проведен теоретический и экспериментальный анализ проводимости электрического тока в милливольтовом диапазоне через различные участки кожи человека. Установлено, что участки кожи представлены тремя видами кластеров:

1. Непроводящие (вся кожа - кроме акупунктурных точек).

КВЧ – Пунктура и Микросистемы

М.Теппоне, Р.Авакян, Л.Новикова

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Крайне высокочастотная (КВЧ) пунктура, в качестве фактора воздействия на точки акупунктуры и рефлексогенные зоны, использует нетепловое электромагнитное излучение (ЭМИ) миллиметрового (ММ) диапазона.

Важной особенностью ММ волн является возможность стимулировать широкий спектр различных сенсорных реакций (феномен De Qi) непосредственно в зоне нарушения. Это позволяет эффективно использовать КВЧ-пунктуру для воздействия на различные микросистемы: ушная раковина, область носа, поверхность ладони и стопы, точки пульса и др.

В любой из вышеперечисленных микросистем определяются зоны/точки, имеющие измененную чувствительность (болевые точки) или электропроводимость. На эти "аномальные" зоны/точки устанавливается антенна генератора ММ ЭМИ.

Длительность воздействия определяется скоростью появления-исчезновения, локализацией и характером возникающих сенсорных реакций (феномен De Qi).

Эффект тонизации реализуется в течение первых 2-3 минут и сопровождается быстрым появлением и нарастанием интенсивности комфортных ощущений в области условной локализации больного органа

Эффект торможения реализуется в течение 15-20-30 минут и сопровождается появлением, нарастанием интенсивности, стабилизацией, а затем исчезновением дискомфортных ощущений.

КВЧ-пунктура может быть использована для воздействия на традиционные точки радиалного пульса, которые также являются лечебно-диагностической микросистемой. Волновод генератора ММ ЭМИ устанавливается на точку позиции пульса, пальпация которой вызывает изменение выраженности имеющегося симптома пациента. Длительность воздействия определяется скоростью появления и характером сенсорных реакций.

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Научный Совет Российской академии наук
по проблеме "Физическая электроника"

Закрытое акционерное общество "МТА-КВЧ"

Институт радиотехники и электроники
Российской академии наук

Всероссийское научно-техническое общество радиотехники,
электроники и связи имени А.С.Попова

Закрытое акционерное общество РЕНТЕХ

Акционерное общество "НПО-Форум"

11 РОССИЙСКИЙ СИМПОЗИУМ
С МЕЖДУНАРОДНЫМ УЧАСТИЕМ

МИЛЛИМЕТРОВЫЕ ВОЛНЫ В МЕДИЦИНЕ И БИОЛОГИИ

Сборник докладов

Москва, 1997

DIFFERENTIATED THREE-LEVEL MM CORRECTION OF VEGETATIVE DISFUNCTIONS IN GENITAL ORGANS

A.Ja.Katin

An individually selected MW-influence on specific Voll-acupoints is exercised in suprasegmentary, segmentary and njdal subdivisions of the vegetative nervous system. This method of the three-level MW-acupuntute coorrection is highly effective and ensures a differentiated approach in testing dysfunctions of genital organs.

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11 Российский симпозиум с международным участием
Миллиметровые волны в медицине и биологии

МЕТОДИКИ КВЧ-ТЕРАПИИ И ТРАДИЦИОННАЯ КИТАЙСКАЯ МЕДИЦИНА

М.Теппоне, Р.Авакян

Производственно-конструкторское предприятие гуманитарных информационных технологий, Россия, 111250, Москва, ул. Красноказарменная, 14 1)

Методики КВЧ-терапии

Многообразие биологических эффектов, наблюдаемых при воздействии ММ ЭМИ, определило формирование *трех основных методик* лечебного использования миллиметровых волн:

1. КВЧ- или ММВ-терапия без индивидуализации частоты ЭМИ и зоны воздействия:

При создании этой методики лечения авторы указывали на резонансный характер взаимодействия ММ волн с биологическими объектами. Однако используемый набор частот не превышает 2-3-6 (42,19; 53,53; 60,12 ГГц и др.), а зоны воздействия, локализуются лишь в области грудины, эпигастрия или на крупных суставах [1]. Индивидуализация лечения, осуществляется на основе оценки общего адаптационного синдрома (ОАС), в частности, по лейкограмме больного [2].

2) В основе Микроволновой резонансной терапии (МРТ) лежит гипотеза о наличии «*собственных характеристических частот*» [3]. Во время первой процедуры на одну из точек акупунктуры (ТА) «общего действия» осуществляется воздействие когерентным ММ ЭМИ изменяющейся частоты. Определенные частоты ЭМИ вызывают у пациента различные сенсорные реакции (мурашки, волны, тепло, холод и др.). Комфортный характер ощущений служит критерием индивидуальной лечебной частоты, используемой в процессе лечения [4].

3) Многозональная КВЧ-терапия или КВЧ-пунктура базируется на результатах клинических исследований позволяющих утверждать, что при проведении КВЧ-терапии ведущее значение в достижении положительного результата принадлежит зоне/точке воз-

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1) Адрес для переписки: Россия, 140070, Московская обл., Томилино, ул. Пионерская, 8-92

действия, а не частоте ЭМИ [5], а сенсорные реакции пациента, возникающие при КВЧ-воздействии, соответствуют феномену «*De Qi*», известному в традиционной китайской медицине (ТКМ) [6].

Анализ жалоб и анамнеза заболевания, данных, полученных при осмотре языка и пальпации пульса, позволяют установить синдромный диагноз ТКМ, выбрать точки акупунктуры и адекватный режим лечения. Индивидуализация длительности воздействия осуществляется с учетом сенсорных реакций, возникающих у пациента во время проведения лечебной процедуры. Для достижения тонизирующего эффекта время воздействия не превышает 2-3 минут (быстрое появление и нарастание интенсивности комфортных ощущений), а тормозной эффект достигается 15-30-минутным воздействием (медленное появление, стабилизация и исчезновение дискомфортных ощущений). При КВЧ-пунктуре используется когерентное, «шумовое» или комбинированное (шумовое и когерентное) ММ-излучение [7-8].

2. Основные факторы, определяющие эффективность лечебной процедуры в ТКМ

С точки зрения ТКМ, при проведении акупунктуры у пациента необходимо вызвать специфические или предусмотренные ощущения, получившие название *"феномен Де Чи"* или *"феномен прибытия энергии (Qi)"*. Эти ощущения являются показателем эффективности лечебной процедуры и сопровождаются субъективным и объективным улучшением состояния пациента.

Интенсивность и характер сенсорных реакций, а также достигаемый клинический эффект, определяются несколькими факторами [9]:

I. *Исходное состояние* пациента, состояние его органов, каналов и ТА.

Появление сенсорных реакций при синдроме Пустоты отражает реализацию эффекта тонизации, а при синдроме Полноты - эффекта торможения.

II. *Специфичность ТА или зоны.*

Имеются вполне определенные кожные зоны и ТА, воздействие на которые позволяет получать тот или иной специфический эффект, например: зоны Захарьина-Геда и Вильямовского, тонизирующие и тормозные ТА, различные микросистемы (зоны ушной раковины, ладони, стопы) и др. Для адекватного выбора зоны или ТА необходимо поставить синдромный диагноз ТКМ.

III. *Специфичность манипуляции* при воздействии на ТА или зону.

Условно можно выделить тонизирующую и тормозную методики, которые отличаются по используемым иглам, глубине укалывания, скорости введения и выведения иглы, длительности нахождения иглы в тканях, направлению введения и вращения иглы и т.д.

3. Методики КВЧ-терапии с точки зрения теории ТКМ

Одной из уникальных особенностей ММ ЭМИ является возможность стимуляции сенсорных реакций не только в зоне воздействия, но и в зоне локализации больного органа. Другими словами, *"феномен Де Чи"* или *"феномен прибытия энергии (Qi)"* реализуется непосредственно в зоне нарушений.

3.1. КВЧ-терапия без индивидуализации частоты и зоны воздействия.

Использование стандартных кожных зон и набора из 2-6-х частот ЭМИ обеспечивает реализацию эффектов, которые зависят только от *исходного состояния* пациента, т.е. фактора № I. Некоторые вариации длительности и периодичности проведения процедур, основанные на оценке ОАС, частично включают механизмы, определяемые специфичностью *манипуляции*, т.е. фактора № III.

3.2. КВЧ-терапия с индивидуализацией частоты ММ ЭМИ или МРТ.

Прежде всего реализуются эффекты, обусловленные *исходным состоянием* пациента (фактор № I). Подбор индивидуальной лечебной частоты можно рассматривать как *индивидуализацию манипуляции* (фактор № III). Учитывая то, что критерием выбора индивидуальной лечебной частоты, служит комфортный характер сенсорных реакций больного, при МРТ наиболее часто реализуется тонизирующий эффект манипуляции по отношению к органам и каналам, находящимся в состоянии Пустоты.

3.3. КВЧ-терапия с индивидуализацией зоны воздействия или КВЧ-пунктура.

Для КВЧ-пунктуры, как и для других методик КВЧ-терапии характерна реализация эффектов, обусловленных *исходным состоянием* пациента (фактор № I). Индивидуализация зоны воздействия включает эффекты, обусловленные *специфичностью функции ТА* (фактор № II). Индивидуализация длительности воздействия на ТА реализует эффекты, обусловленные *специфичностью манипуляции* (фактор № III). На первый взгляд кажется очевидным необходимость сочетания индивидуализации зоны воздействия (фактор № II) и частоты ММ ЭМИ (фактор № III). Однако при правильном выборе ТА, воздействие на нее почти всегда сопровождается появлением сенсорных реакций: быстрое появление и нарастание интенсивности комфортных ощущений при синдроме Пустоты и медленное появление, стабилизация и исчезновение дискомфортных ощущений при синдроме Полноты. Таким образом, реализацию *специфичности манипуляции* обеспечивает длительность воздействия на ТА, а не индивидуализация частоты ЭМИ.

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MM WAVE THERAPY TECHNOLOGIES AND THE TRADITIONAL CHINESE MEDICINE

M.Teppone, R.Avakian

Authors divide EHF/MMW-Therapy into three independent branches: Microwave Resonance Therapy (individualization of therapeutic frequency), Extremely High Frequency Puncture (individualization of irradiated zone/acupoint) and Extremely High Frequency or MM-Wave Therapy (without individualization both frequency and irradiated zone). Differentiation of these therapeutic modalities according to main principles of traditional Chinese medicine has been done.

КВЧ-ПУНКТУРА НА ОБЛАСТЬ ПУЛЬСА

М.Теппоне, Р.Авакян

Производственно-конструкторское предприятие гуманитарных информационных технологий, Россия, 111250, Москва, ул. Красноказарменная, 14 [2]

В традиционной китайской медицине (ТКМ) считается, что пальпация пульса на лучевой артерии в области шиловидного отростка позволяет получить информацию о состоянии 12 главных каналов и органов. Однако классическая пульсовая диагностика достаточно трудна, что ограничивает её изучение и применение западными врачами.

Традционный взгляд на пульсовую диагностику

Пальпация пульса в ТКМ проводится на лучевой артерии в области трех позиций:

Позиция	Название	Локализация
I-я	• *Цунь*	-дистальней от позиции Гуань
II-я	• *Гуань*	-над шиловидным отростком
III-я	• *Чи*	-проксимальней от позиции Гуань

Имеются следующие соответствия пульсовых позиций и внутренних органов

Справа		Позиции	Слева	
Поверхностный	*Глубокий*		*Глубокий*	*Поверхностный*
• Толстый кишечник	• Легкие	*-Цунь-*	• Сердце	• Тонкий кишечник
• Желудок	• Селезенка	*-Гуань-*	• Печень	• Желчный пузырь
• Тройной [3] обогреватель	• Перикард	*-Чи-*	• Почки	• Мочевой пузырь

Поверхностный пульс является волной, бегущей по сосудистой стенке. Между наружной и внутренней сосудистыми стенками имеется определенное количество медленно движущейся жидкости в виде крови. Поэтому, поверхностный пульс обычно сравнивали с куском дерева, плавающим на воде.

Поверхностный пульс определяется при легком касании подушечкой пальца исследуемой пульсовой позиции.

Глубокий пульс является результатом взаимодействия волн, бегущих по наружной и внутренней сосудистым стенкам. Между сосудистыми стенками нет амортизирующей жидкости в виде крови. Этот пульс сравнивают с маленьким камешком, завернутым в хлопок.

Глубокий пульс определяется на самом дне сосуда. После полного пережатия артерии необходимо медленно поднять палец до появления первых пульсовых волн [1, 2].

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[2] Адрес для переписки: Россия, 140070, Московская обл., Томилино, ул. Пионерская, 8-92

Новый вариант упрощенной пульсовой диагностики

При традиционной методике пульсовой диагностики только врач является активным диагностирующим лицом. Пациент играет пассивную роль исследуемого. В новом варианте пульсовой диагностики большое внимание уделяется ощущениям, возникающим у пациента во время пальпации пульса.

Во время проведения пульсовой диагностики было замечено, что пальпация определенных позиций пульса сопровождалась изменением состояния больного в сторону улучшения или ухудшения. Если же имеются какие-либо симптомы, например, одышка, кашель, головные боли и др., пациент отмечает изменение интенсивности этих симптомов.

Динамика имеющихся симптомов или появление общего состояния комфорта или дискомфорта позволяют оценивать состояние соответствующего канала и органа как проявление "Пустоты" при улучшении и "Полноты" - при ухудшении.

Если имеются различия в ощущениях пациента при пальпации глубокого и поверхностного пульсов в одной и той же позиции, это указывает на дисбаланс между каналами, формирующими Инь-Ян пару. Например, у больного с болями в животе пальпация поверхностного пульса во второй позиции справа сопровождается усилением интенсивности болей, а при пальпации глубокого пульса - уменьшением. Предположительный диагноз "Полнота Желудка и Пустота Селезенки".

Наличие однотипных ощущений при пальпации глубокого и поверхностного пульса говорит об изменении состояния обеих каналов, принадлежащих одному элементу. Например, височная головная боль, усиливающаяся при пальпации поверхностного и глубокого пульсов во второй позиции слева говорит о вероятном синдроме Полноты элемента "Дерево", т.е. "Полнота Печени и Желчного пузыря".

Пальпация всех позиций пульса позволяет установить более точную локализацию и симптома, и причины нарушений.

Выявленный таким образом диагноз отражает состояние Полноты или Пустоты канала без уточнения Внешней или Внутренней причины заболевания. При необходимости переводить избыток *Qi* из канала Ян в канал Инь, рекомендуется предварительно рассеять точку Хе ("море") на канале Ян. В первом примере, перед тонизацией точки Юань канала Селезенки необходимо рассеить точку Хе канала Желудка, т.е. St36 (*Цзу Сань Ли*).

КВЧ-терапия на область пульса

Согласно трудам по ТКМ энергия всех органов проявляется в пульсе в областях Цунь, Гуань и Чи. Наличие же реакции пациентов на пальпацию пульса свидетельствует о возможности активного влияния на состояние органов через точки пульса. Таким образом, область пульса является такой же диагностической и лечебной микросистемой, как ушная раковина, радужная оболочка глаза, подошва, ладонь, нос, язык и др.

Уникальная особенность ММ ЭМИ заключается в том, что феномен *De Qi* реализуется не только в зоне облучения, но и в зоне имеющихся нарушений. Поэтому, КВЧ-воздействие на точку определенной пульсовой позиции, оказывает влияние на связанные с ней каналы и органы.

Практическое использование КВЧ-пунктуры на область пульса

На основании классических методов ТКМ или упрощенного варианта пульсовой диагностики выявляется локализация и характер нарушений.

Выбирается позиция пульса, связанная с первичным нарушением. Над проекцией лучевой артерии определяется середина позиции пульса. Для уточнения локализации точки пульса можно использовать металлический щуп, напоминающий карандаш с закругленным кончиком, имеющим полушарообразную форму с диаметром около 1,0 мм.

На выбранную точку устанавливается диэлектрическая антенна генератора ММ ЭМИ и наблюдаются сенсорные реакции пациента. Быстрое появление комфортных ощущений (не в области пульса), отражает тонизирующий эффект по отношению к каналам, находящимся в состоянии Пустоты, а медленное появление и исчезновение дискомфортных ощущений, отражает тормозный эффект по отношению к каналам, находящимся в состоянии Полноты. Появляющиеся сенсорные реакции позволяют не только уточнять характер нарушения, но и индивидуализировать длительность воздействия на точку пульса.

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EHF PUNCTURE ON THE PULSE ZONE

M.Teppone, R.Avakian

Authors propose a new version of the Chinese pulse diagnostic technique, based on the sensory reactions of the patients appearing during palpation of their pulse. A new version of EHF-Puncture on the pulse points has been described.

11 Российский симпозиум с международным участием

Миллиметровые волны в медицине и биологии

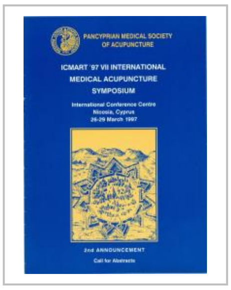
РЕШЁННЫЕ И НЕРЕШЁННЫЕ ПРОБЛЕМЫ СПЕКТРАЛЬНО-ВОЛНОВОЙ ДИАГНОСТИКИ И ПРЕЦИЗИОННО-ВОЛНОВОЙ ТЕРАПИИ

А.И.Гуляев, Л.А.Лисенкова, В.Ф.Киричук, В.И.Петросян, Н.Д.Девятков, Ю.В.Гуляев, Н.И.Синицын, В.А.Ёлкин, В.В.Фёдоров, О.П.Ликашина, Е.В.Чернова, Н.А.Маркина

Саратовский государственный медицинский университет,
Саратовский филиал Института радиотехники и электроники РАН,
ООО "Научно-лечебный центр физики и новых методов медицины", г. Саратов

Исследования влияния миллиметровых радиоволн на живые организмы, активно проводимые уже свыше тридцати лет, способствовали значительному прогрессу в установлении механизмов взаимодействия КВЧ-излучений с клетками.

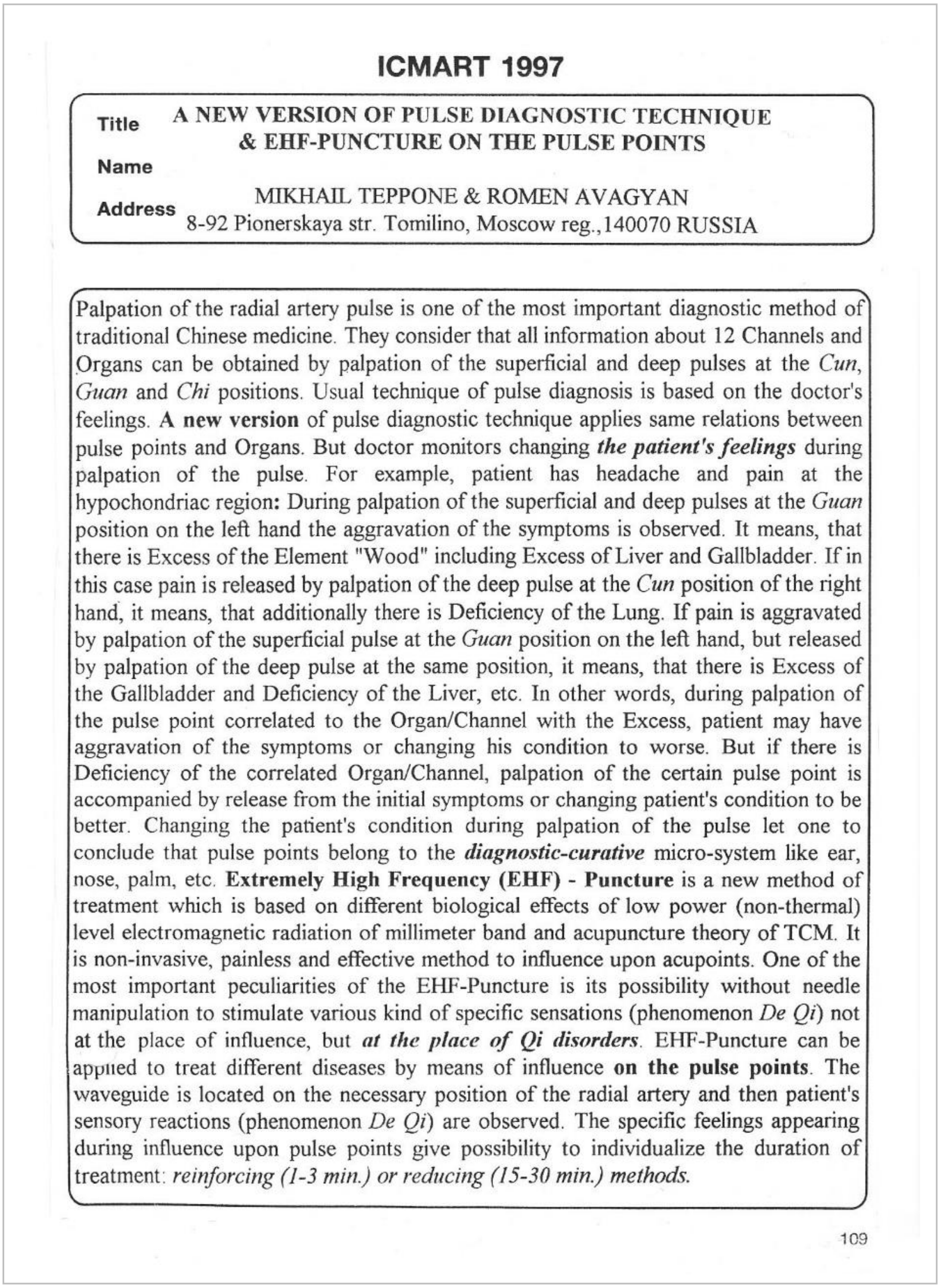
Учитывая большую социальную значимость создания новых ненагрузочных, неинвазивных диагностических и терапевтических методов, авторы ставили перед собой цель разработать новые способы диагностики и терапии различных заболеваний при помощи облучения проекций соответствующих органов миллиметровыми радиоволнами в резонансных частотах воды, а также оценить эффективность этих способов на основании анализа собственных клинических данных.



A New Version of Pulse Diagnostic Technique & EHF-Puncture on the Pulse Points

M.Teppone, R.Avagyan

ICMART '97 VII International Medical Acupuncture Symposium
March 26-29, 1997, Nicosia, Cyprus, p. 109
https://archive.org/details/1997-pulse-icmart



ICMART 1997

Title A NEW VERSION OF PULSE DIAGNOSTIC TECHNIQUE & EHF-PUNCTURE ON THE PULSE POINTS

Name MIKHAIL TEPPONE & ROMEN AVAGYAN

Address 8-92 Pionerskaya str. Tomilino, Moscow reg.,140070 RUSSIA

Palpation of the radial artery pulse is one of the most important diagnostic method of traditional Chinese medicine. They consider that all information about 12 Channels and Organs can be obtained by palpation of the superficial and deep pulses at the *Cun*, *Guan* and *Chi* positions. Usual technique of pulse diagnosis is based on the doctor's feelings. **A new version** of pulse diagnostic technique applies same relations between pulse points and Organs. But doctor monitors changing ***the patient's feelings*** during palpation of the pulse. For example, patient has headache and pain at the hypochondriac region**:** During palpation of the superficial and deep pulses at the *Guan* position on the left hand the aggravation of the symptoms is observed. It means, that there is Excess of the Element "Wood" including Excess of Liver and Gallbladder. If in this case pain is released by palpation of the deep pulse at the *Cun* position of the right hand, it means, that additionally there is Deficiency of the Lung. If pain is aggravated by palpation of the superficial pulse at the *Guan* position on the left hand, but released by palpation of the deep pulse at the same position, it means, that there is Excess of the Gallbladder and Deficiency of the Liver, etc. In other words, during palpation of the pulse point correlated to the Organ/Channel with the Excess, patient may have aggravation of the symptoms or changing his condition to worse. But if there is Deficiency of the correlated Organ/Channel, palpation of the certain pulse point is accompanied by release from the initial symptoms or changing patient's condition to be better. Changing the patient's condition during palpation of the pulse let one to conclude that pulse points belong to the ***diagnostic-curative*** micro-system like ear, nose, palm, etc. **Extremely High Frequency (EHF) - Puncture** is a new method of treatment which is based on different biological effects of low power (non-thermal) level electromagnetic radiation of millimeter band and acupuncture theory of TCM. It is non-invasive, painless and effective method to influence upon acupoints. One of the most important peculiarities of the EHF-Puncture is its possibility without needle manipulation to stimulate various kind of specific sensations (phenomenon *De Qi*) not at the place of influence, but ***at the place of Qi disorders***. EHF-Puncture can be applied to treat different diseases by means of influence **on the pulse points**. The waveguide is located on the necessary position of the radial artery and then patient's sensory reactions (phenomenon *De Qi*) are observed. The specific feelings appearing during influence upon pulse points give possibility to individualize the duration of treatment: *reinforcing (1-3 min.) or reducing (15-30 min.) methods.*

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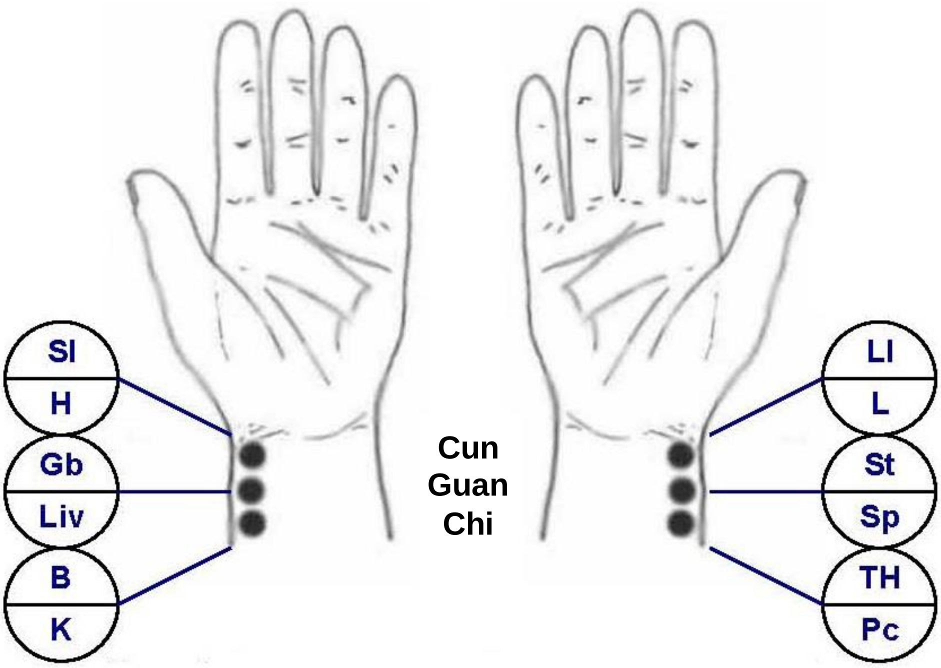
These illustrations were presented at the Symposium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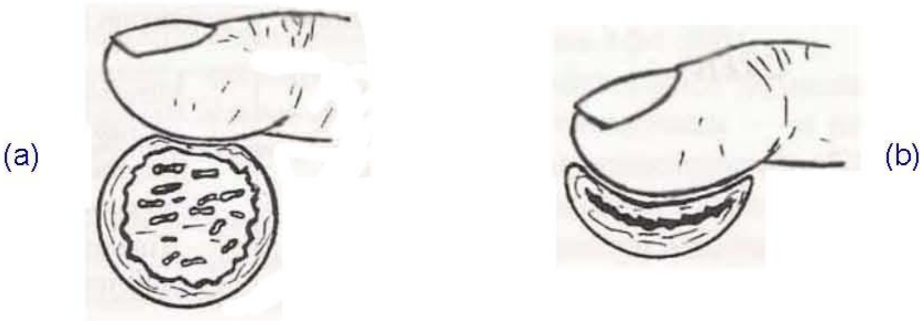
Correspondence of 12 organs to the pulse points



Palpation of superficial (a) and deep (b) pulse

Варианты ММ – Волновой Терапии

М. Теппоне, Р. Авакян

ПКП ГИТ, г. Москва

III Всероссийская научно-практическая конференция по квантовой терапии
Москва, 17-20 декабря 1996, (сб. докладов), с. 25-26

Низкоинтенсивное (нетепловое) электромагнитное излучение (ЭМИ) миллиметрового диапазона является основой новых методов лечения, получивших название – ММ-волновая терапия, крайне высокочастотная (КВЧ) – терапия и микроволновая резонансная терапия (МРТ).[1]

Имеется несколько гипотез, объясняющих биологические эффекты миллиметровых волн:

1. Внешнее ММ ЭМИ имитирует собственные колебания клеток и различных субклеточных структур, что сопровождается формированием акустоэлектрических волн в клеточных мембранах. Клетки начинают генерировать сигналы управления восстановительными и приспособительными процессами с формированием новых мембран и мембранных комплексов. Сигналы управления могут распространяться в многоклеточном организме, что обеспечивает эффективность воздействия ММ ЭМИ на животных и человека. В зависимости от частоты возникают те или иные биорезонансные эффекты с реализацией имеющихся резервов и ускорением адаптационных и восстановительных процессов, направленных на устранения имеющихся нарушений.[2]

2. Первичной мишенью для ММ ЭМИ являются молекулы воды. Происходит «ММ-накачка» воды верхних слоев кожи, что сопровождается увеличением фракции ротационно-энергозависимых молекул воды с повышенной химической активностью. Изменение степени гидратации белков клеточных мембран приводит к их информационным изменениям, что отражается на ионном транспорте и активности АТФ-синтетазы энергообразующих мембран. Синтез АТФ и ее накоплением обусловливает физиологические эффекты стимуляции.[3]

3. Для каждого биологического объекта и человека, в частности, предполагается наличие собственных «характеристических частот». Воздействие этими частотами сопровождается резонансным откликом организма и коррекцией нарушенного гомеостаза. Распространение ММ волн в организме многоклеточных животных и человека происходит по «каналам», описанным в традиционной китайской медицине (ТКМ).[4]

Экспериментальные и клинические работы позволяют выделить три типа эффектов, наблюдаемых при воздействии ММ ЭМИ:

1. Специфические эффекты, связанные с частотой ЭМИ.
2. Неспецифические эффекты, связанные с облучаемой зоной.
3. Эффекты, обусловленные развитием общего адаптационного синдрома Селье (ОАС).

Это многообразие биологических эффектов определило формирование трех основных групп методик лечебного использования миллиметровых волн:

1. Микроволновая резонансная терапия (МРТ): Во время проведения первой лечебной процедуры выбирается одна из точек «общего действия», на которую осуществляется воздействие ММ ЭМИ изменяющейся частоты. На определенных частотах у пациента появляются различные сенсорные реакции (мурашки, волны, тепло, холод, и др.). Комфортный характер ощущений служит критерием индивидуальной лечебной частоты. Сенсорный отклик сопровождается изменением различных параметров функционирования организма больного, что в ряде случаев позволяет использовать объективные критерии подбора индивидуальной лечебной частоты.[5]

2. Многозональная КВЧ-терапия или КВЧ-пунктура: Во время работы по объективизации сенсорных реакций пациентов при проведении МРТ было выявлено, что появление ощущений сопровождалось изменением температуры в точках каналов, с которыми были связаны имевшиеся ощущения. Этот факт позволил рассматривать «резонансный отклик» при МРТ как феномен «движения энергии» (*De Qi*), известный в ТКМ. Сравнение эффективности использования ММ волн с индивидуализацией частоты ЭМИ и с индивидуализацией зоны воздействия показало преобладание значимости последней.[6] Ведущая роль зоны воздействия и наблюдаемый во время процедуры феномен *De Qi* легли в основу многозональной КВЧ-терапии или КВЧ-пунктуры.[7]

3. КВЧ- или ММВ-терапия без индивидуализации частоты ЭМИ и зоны воздействия: При создании этой методики лечения авторы указывали на резонансный характер взаимодействий ММ волн с биологическими объектами. Однако используемый набор частот не превышает 2-3, включая 42,19 или 53,53 или 60,12 ГГц, а зоны воздействия локализуются лишь в области грудины, эпигастрия или на крупных суставах. Индивидуализация лечения осуществляется на основе оценки ОАС, в частности, по лйкограмме больного.[8]

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КВЧ / ММВ-пунктура острых заболевани

М. Теппоне, Р. Авакян

ПКП ГИТ, г. Москва

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КВЧ/ММВ-пунктура может успешно применяться для лечения различных острых заболеваний и состояний. При этом используется теория «*Шести каналов*», описывающая острые заболевания или обострение хронических заболеваний с точки зрения развития общего адаптационного синдрома. Кратко суть теории можно изложить следующим образом:

В организме человека существует 6 пар каналов, выполняющих защитную функцию, предохраняя организм от проникновения повреждающего фактора Снаружи Внутрь:

1. *Тай Ян*:	Мочевой пузырь и Тонкий кишечник,
2. *Шао Ян*:	Желчный пузырь и Тройной обогреватель,
3. *Ян Мин*:	Желудок и Толстый кишечник,
4. *Тай Инь*:	Селезенка и Легкие,
5. *Цзюе Инь*:	Печень и Перикард,
6. *Шао Инь*:	Почки и Сердце.

Для каждого уровня или фазы имеется определенный набор *острых неспецифических симптомов* и рекомендации по использованию точек акупунктуры (ТА). Тяжесть заболевания определяется не выраженностью клинических проявлений, а глубиной проникновения внешнего фактора. Различные нозологические формы при обострении могут протекать с одинаковыми неспецифическими симптомами и относиться к одним и тем же уровням, а следовательно, будут нуждаться в одинаковом лечении [1,2].

Клинические проявления поражения уровней:

Тай Ян: *Общие симптомы:* зябкость, лихорадка, жар, головная боль, поверхностный пульс;

Ветер: непереносимость сквозняков, потливость и напряжение мышц шеи;

Жара: жажда, непереносимость жары и выраженная лихорадка;

Холод: зябкость до озноба, ломота в теле, суставные боли, тошнота и приступы удушья;

Шао Ян: *Чередование жара и озноба*, при этом - энергии много, односторонняя головная боль, головокружение, нечеткость зрения, 'мушки' перед глазами, горечь во рту, изжога, сухость в горле, потеря аппетита, боли в области сердца с частыми приступами рвоты, боли и ощущение распирания в боковых частях груди и живота, возможен жидкий стул, красный язык с тонким белым налетом и напряженный пульс.

Ян Мин: *Выраженная лихорадка*, беспокойство, непереносимость тепла, одышка, обильное потоотделение, возможно делириозное состояние;

Боли в животе, усиливающиеся при надавливании и после еды, выраженная жажда, запоры, метеоризм, язык сухой с желтым налетом;

Тай Инь: *Зябкость*, холодные конечности, боли в суставах, тяжесть в теле, отсутствие аппетита и жажды, тошнота или рвота белой слизью;

Боли в животе, уменьшающиеся при надавливании и после еды, жидкий стул, язык бледный с белым налетом, пульс менее 4 ударов за одно дыхание;

Цзюе Инь: а) «Тепло вверху Холод внизу»*:* жажда, ощущение тепла, поднимающегося вверх, боли в области сердца с ощущением жжения, голод, но больного рвет съеденной пищей;

б) «Жара в Печени»*:* дизентерия с кровотечением и тенезмами, различные кровотечения, сухость и горечь во рту;

в) «Попеременная победа Жары и Холода»*:* чередование жара и озноба, энергии мало;

г) «Холод в Печени»*:* ледяные и онемевшие конечности, зеленоватые ногти и пальцы, отсутствие аппетита и жажды, рвота кислым содержимым, боли в животе и напряжение мышц живота, стул с непереваренной пищей, язык малинового цвета;

Шао Инь: а) «Пустота Холод»*:* Холодные конечности, непереносимость холода, сонливость, жидкий стул с непереваренной пищей, язык черноватый, пульс слабый, менее 4 ударов за одно дыхание;

б) «Пустота Тепло»*:* Бессонница, раздражительность, сухость и боли в горле, ощущение тепла в области ладоней, стоп и сердца, боли в области сердца, язык красный, пульс очень слабый, более 6 ударов за одно дыхание.

Рекомендуемые ТА для лечения различных уровней:

1. Тай Ян: L_9 (*Тай Юань*) и L_{10} (*Юй Цзи*) - [тормозить],
Sp_1 (*Инь Бай*), Sp_2 (*Да Ду*) -[стимулировать];

2. Шао Ян: St_{42} (*Чун Ян*) - [стимулировать], B_{58} (*Фэй Ян*) - [тормозить];

3. Ян Мин: Sp_2 (*Да Ду*) - [стимулировать], Gb_{38} (*Ян Фу*) - [тормозить];

4. Тай Инь: Sp_3 (*Тай Бай*) - [стимулировать], St_{40} (*Фэн Лун*) - [тормозить];

5. Цзюе Инь: а) Liv_8 (*Цюй Цюань*) и Liv_3 (*Тай Чун*) - [стимулировать];
б) Liv_3 (*Тай Чун*) - [тормозить];
в) L_9 (*Тай Юань*) и Sp_2 (*Да Ду*) - [стимулировать];
г) Liv_2 (*Син Цзянь*) и Liv_3 (*Тай Чун*) - [стимулировать];

6. Шао Инь: а) St_{42} (*Чун Ян*) - [стимулировать] и Sp_4 (*Гунь Сунь*) - [тормозить];
б) St_{41} (*Цзе Си*), Sp_2 (*Да Ду*) и др. - [стимулировать].

Ограниченность используемых точек акупунктуры и высокая эффективность проводимого лечения позволяет рекомендовать использование «*Теории шести каналов*» в практической медицине. При проведении процедуры модальность КВЧ/ММВ-пунктуры (стимуляция и торможение) определяется длительностью проводимой терапии. Для стимулирующего эффекта длительность воздействия не превышает 2-3 минут, а для тормозного - 15-20 минут.[3]

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EXTREMELY HIGH FREQUENCY (EHF) PUNCTURE THERAPY AND SYNDROMES OF TRADITIONAL CHINESE MEDICINE

Mikhail Teppone and Alexey Krotenko

8-92 Pionerskaya str. Tomilino, Moscow reg. *140070 Russia*

ABSTRACT Extremely high frequency (EHF) puncture is a new method of treatment based upon biological effects of low power electromagnetic waves of millimetric band and acupuncture theory of traditional Chinese medicine (TCM). It is non-invasive, painless and effective.

Extensiveness and variety of the specific sensations (Deqi phenomenon) during EHF-puncture reflect intensive reactions of the patient's organism and provide individualization of therapy.

EHF-puncture is a step of integration of traditional Chinese with modern Western medicines.

KEY WORDS Extremely high frquency therapy Syndrome of TCM Millimeter electromagnetic radiation

EXTREMELY HIGH FREQUENCY (EHF) THERAPY

Low intensive electromagnetic radiation (EMR) of MM band is absorbed by hydrated structures mainly[1], in natural space MM EMR is blocked with the water molecules of the atmosphere. It results in high sensitivity of bio-objects to artificial MM EMR.

There are several kinds of devices to conduct EHF-therapy, which give possibility to apply EMR with individual and fixed frequency and to radiate locally on the skin projections of acupoints (AP) or on the wide skin zones: Jav-I, Electronica-EHF, G4-142, etc.. Some of them has frequency deviation and incorporated measuring of the power of EMR and the modulator-attenuator, for example-Phytya-ASKVIT. Fig. 1

Analysis of te literature dealing with the EHF-problem lets it possible to specify several types of the effect appearing during EHF-influence:

1) Specific effects associated with the frequency of MM EMR,

2) Non-specific effects associated with the irradiated zone,

3) Non-specific effects conditioned by developing of the general adaptation syndrome (GAS)[2-6].

There are several kinds of EHF-therapy that reflect different opinions on the mechanisms through which the therapeutic effect is being realized: EHF-therapy with individual frequency of MM EMR, EHF-therapy with individial irradiated zones, EHF- therapy with both individual frequency and irradiated zones and EHF-therapy without individual frequency as well as zones.

The individual therapeutic frequency (ITF) is generally selected on the strength of sensory reactions experienced by patients during the change of MM-radiation frequency. It is believed that ITF produces the most comfortable sensations and not in the irradiated zone but in the area of projection of the affected organ[6]. The sensory reactions are accompanied by changes in the functions of various organs and systems that can be registrated by means of an electrocardiograpy， an electroencephalograph， an electrogastrograpy， a heat monitor， etc.. Different methods for determining the ITF using instrument have been proposed.

Devices for EHF-Therapy

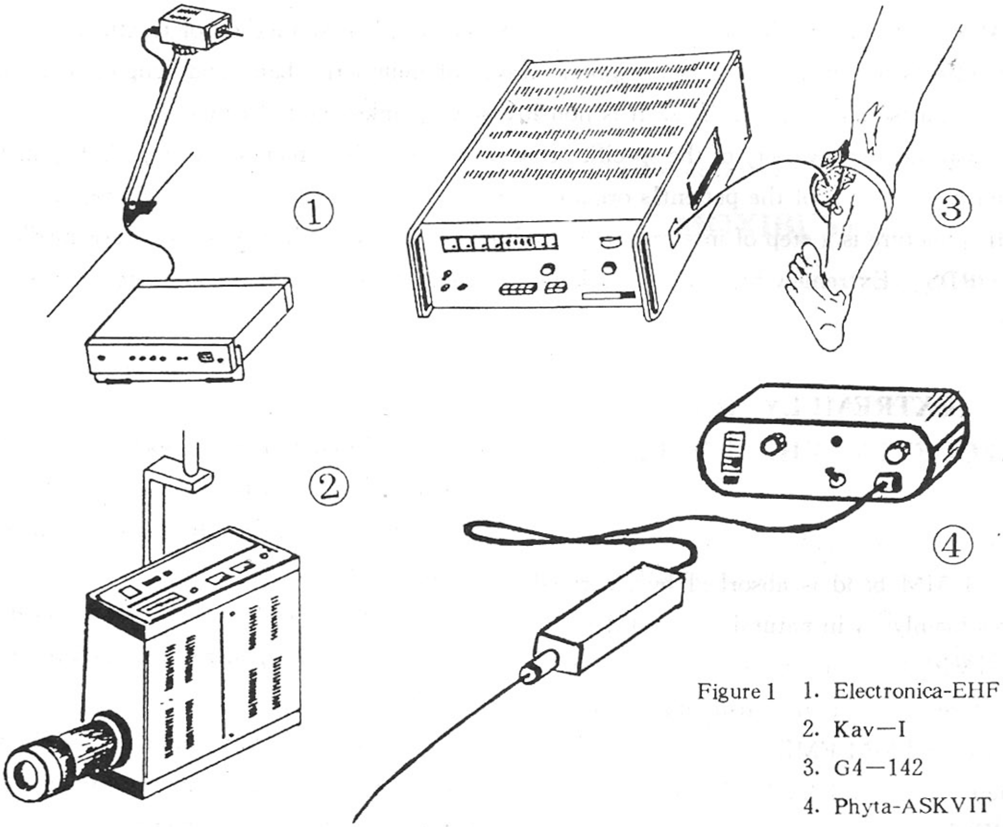

Figure 1 1. Electronica-EHF
2. Kav—I
3. G4—142
4. Phyta-ASKVIT

Temperature measurements were taken on the sites of AP skin projections while EM frequencies were being changed. It was noted that with the appearance of sensations it was possible to observe the changing of the temperature at the AP of the certain meridians. So we suggested that the occuring sensations reflected the phenomenon Deqi (Teh Chi) known from traditional Chinese medicine (TCM). By now there is enough theoretical， experimental and clinical materials[7-9] allowing the assumption that in the leading role of EHF-therapy in enhancing the treatment efficacy is played not by MM EMR frequency but by site (zone) to which the radiation is applied. The radiation frequency determines the peculiarity of MM-EM waves absorbed by the water-containing skin structures[1,10]， i. e. the absorption and reflexion and hence， the intensity of irritation of the stimulated zone. In the end non-specific effect of EHF - therapy is realized through participation of various macroorganism systems and does not differ essnetially from the effects resulting from the action of other factors of electromagnetic and non-electromagnetic nature[11].

SYNDROMES OF TRADITIONAL CHINESE MEDICINE

That is skin of big joints, Zakharjin-Head's zones or AP that are irradiated more often during therapeutic application of MM EMR[12]. It was found that APs were hypersensitive to MM EMR[6] which apparently was due to the high tissue hydration of AP[13]. Fig 2.

Zones of the Skin Applied for EHF-Therapy

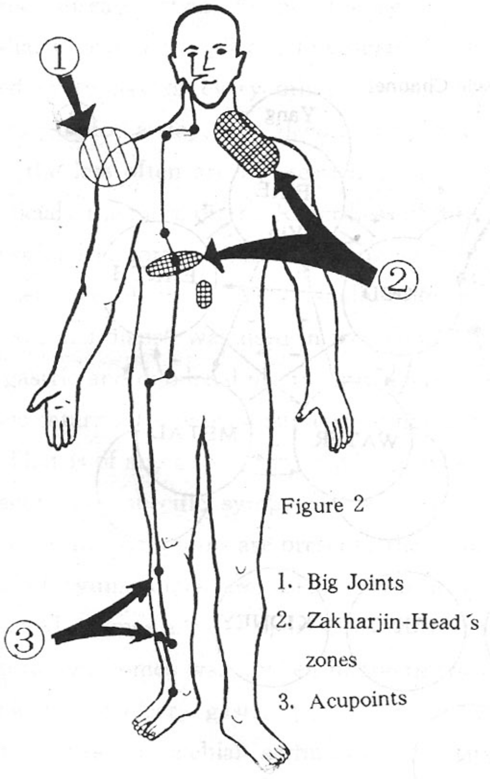

Figure 2

1. Big Joints
2. Zakharjin-Head's zones
3. Acupoints

Most patients, no matter what their diseases are, produce certain types of symptoms:

1) Acute non-specific symptoms reflecting the development of the general adaptation syndrome (or Selye's syndrome of adaptation).

2) Specific symptoms reflecting the particular features of the disease.

3) Chronic non-specific symptoms conditioned by constitutional peculiarities of the patient.

Domination of this or that group of symptoms is determined by the acuity of the pathologic process. The more acute the onset of the disease, the more GAS symptoms. When the process becomes less acute, some specific symptoms appear which are conditioned by the nosologic from or " localization" of the affection. After that the constitutional symptoms start to play the leading role. When chronic disease is being treated the reverse order in the change of clinical manifestations is usually observed. Analysis of different TCM theories allows to select the groups of syndromes describing specific and non-specific symptoms of acute and chronic diseases.

1. Syndromes of the first group:

The acute non-specific symptoms are most comprehensively described by Chinese physician Zhang Zhongjing in " Treatise on Febrile Diseases caused by Cold (Shanghan Lun)"[14,15]. If a disease is characterized only by the signs of Heat, then the theory of the four stages (Wei, Qi, Ying, Xue) can be used[16,17]. If disease is of Heat-Damp nature, then the theory of the Triple Energizer Meridian (Sanjiao) is in use[16-18]. Fig. 3-1.

2. Syndromes of the second group:

Specific symptoms of the diseases are differentiated according to the syndromes affecting " Zang and FU organs" and "Meridians and Collaterals" (regular, tendo—muscular, Luo and divergent)[16,17]. Fig. 3-2.

3. Syndromes of the third group:

Chronic non-specific symptoms are described according to the "Five Constitutions", syndromes of deficiency of Zang organs, Yin, Yang, blood, Qi and four Seas[16-18]. Fig. 3-3.

Application of different Theories of Traditional Chinese Medicine

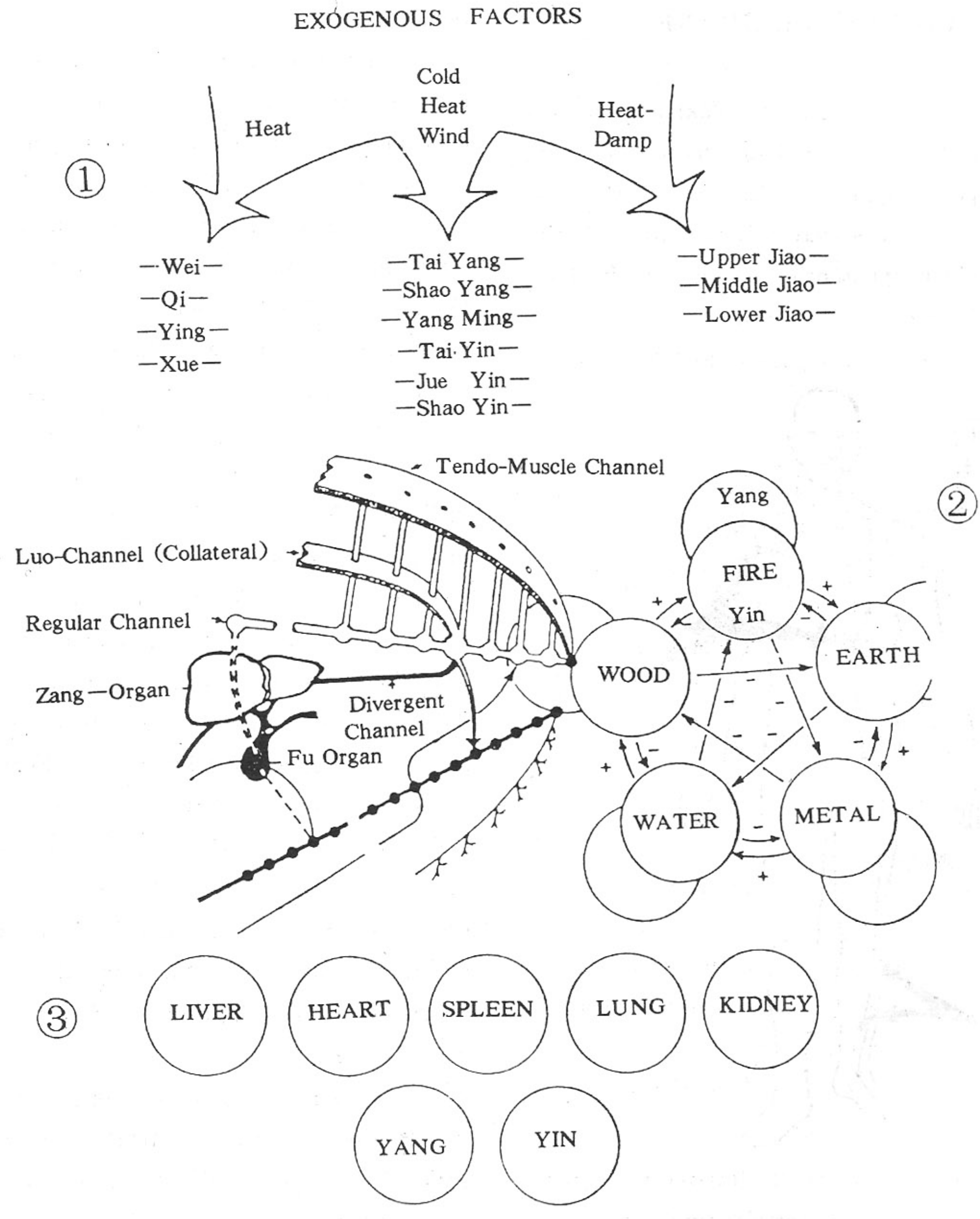
EXOGENOUS FACTORS
Heat
Cold
Heat
Wind
Heat-
Damp
①
—Wei—
—Qi—
—Ying—
—Xue—
—Tai Yang—
—Shao Yang—
—Yang Ming—
—Tai Yin—
—Jue Yin—
—Shao Yin—
—Upper Jiao—
—Middle Jiao—
—Lower Jiao—
Tendo-Muscle Channel
Luo-Channel (Collateral)
Regular Channel
Zang—Organ
Divergent
Channel
Fu Organ
②
Yang
FIRE
Yin
WOOD
EARTH
WATER
METAL
+
-
③
LIVER
HEART
SPLEEN
LUNG
KIDNEY
YANG
YIN

Figure 3

1. Syndromes of the 1st group: Six Channels Four Stages San Jiao
2. Syndromes of the 2nd group: Channels & Collaterals Zang & Fu Organs
3. Syndromes of the 3rd group: Deficiency of Zang Organs Deficiency of Yang & Yin

Symptoms of the damage to the Curious (Extra-) channels can be placed into any of the syndrome groups described above. Yangwei connects the levels Taiyang and Shaoyang while Yinwei links the 3 Yin levels: Taiyin, Jueyin and Shaoyin. So these syndromes can be used in combination with "the theory of six meridians" in treatment of exogenous diseases[16,17,19]. Besides, each Curious Channel has certain constitutional peculiarities[20] and disorder due to endogenous factors[17,18,22].

The order in which the syndromes of different groups are used: If the patient shows manifestations of an acute disease or aggravation of a chronic disease then " the theory of six meridians" can be applied. Treatment is conducted every day or every other day and very seldom — twice a day. the deeper the diseased level, the less often are the sessions; the more superficial, the more often. Regardless of different noslolgical form, similar syndromes determine selection of similar AP. Usually "the theory of six meridians" was used in treatment of acute gastric and duodenal ulcers, initial stages of various catarrhal disease, abstinence syndromes, etc. That is of any disease and condition when " the acute non-specific symptoms" are present. When specific symptoms are present, the second group of synmdromes are used. Treatment is conducted 2 times a week or less. Usually, this group of syndromes was applied in treatment of chronic peptic ulcer, gastric polyps, renal and hepatic cysts, bronchial asthma, etc.. The third group of syndromes was applied to treat diseases with chronic non-specific symptoms. The procedures were usually carried out according to the principles of the "Shu-Mu therapy". Additionally the "Specific" points and points of the "Four seas" were used. Sessions were conducted once a week or less often. When there are Deficiency syndromes of several Zang organs, it is necessary to take into account their interaction according to "the law of the Five Elements". Syndromes of the third group were usually involved in treatment of Coronary Heart Diseases (Angina Pectoris), bronchial asthma, constipation, enuresis and other chronic diseases.

There is a possibility, sometimes, to use together syndromes of different groups, for instance, the simultaneous presence of related syndromes: Yangming, Deficiency of the Stomach Yin and Deficiency of Yin (or Kidney Yin). Fig. 3.

Recommendations of TCM on the choice of the side of the body for the treatment should be taken into account. If it is necessary to sedate AP, in summer and spring time it is better to act mostly on the right side of the body, whereas in autumn and winter on the left side of the body[18].

MODALITY OF THE EHF-INFLUENCE

MM EMR can be used for curing diseases of the Deficiency and Excess, Heat and Cold types. The modality of the effect is determined by the duration of points irradiation. For tonifying (t) effect the duration does not exceed 2—5 minutes. It is necessary to wait for the first specific sensations (SS). For the sedating (S) effect the irradiation should be 15—20—25 minutes. It is necessary to wait for the appearance of the SS, the build up of their intensity and following subsiding. For the "warming up" the action does not exceed 0.5—2.0 minutes. Some patients have a sensations of warmth in the irradiated area or in the other place of the body. This is accompanied by the pulse quikening, from 2—3 beats (Cold) to 5 (Normal) per one breath. For the "cooling" the action duration may reach 20—30 minutes and more. The pulse rate gets lower from 6—8 beats (Heat) to 5 beats per breath.

SPECIFIC SENSATIONS DURING EHF-PUNCTURE

Specific sensations during EHF-Puncture have some peculiarities. According to the TCM theory the curative effect of the treatment can be assessed on the basis of the specific sensations (phenomenon "De Qi" or "Ten Chi") that patients feel during acupuncture, Qigong and other TCM treatment methods. There are several types of De Qi. The first one involves sensations arising in the AP region. The second type includes sensations propagated along the meridian. The third kind of De Qi refers to the entire meridian or Organ.

During EHF-puncture sessions the first De Qi is rather seldom. Usually in the beginning of the session some "waves" or "creeps" appear that propagate along the extremities and the trunk. After that the patients experience various sensations which reflect elimination of the initially present disorders. With the "Deficiency of the Spleen" syndrome, for example, which apart from other symptoms is characterized by the "heaviness in the body" after 1—2 minutes irradiation of AP Dadu (SP 2), the patient feels "lightness in the abdomen or in the entire body", "rocking" or even "flies above the couch". Irradiation of Zusanli (ST 36) or Neiting (ST 44) during 20—30 minutes for the "Excessive Heat in the Stomach" syndrome (increased appetite, constipation, mouth dryness, etc.) is followed by elimination of mouth dryness, increased salivation, feeling of the abdomen cooling down, etc. Some patients experience various "visual sensory reactions" with the closed eyes, that is "change of colors", "appearance of light" or even more complex visual images.

As a rule, the therapeutic effect is linked with the type and intensity of sensory reactions.

INDICATIONS

During our work we tried EHF-puncture in treatment of different diseases including peptic ulcers[9], gastric polyps[22], angina pectoris[23], panic attacs[24], renal and hepatic cysts, bronchial asthma, enuresis, some hematologic diseases, various abstinence and pain syndromes, etc. Apparently, a possibility to diagnose a TCM syndrome is an indication for prescribing EHF-puncture.

The therapeutic effect is generally lower in the patients that have had a surgical intervention in the anamnesis.

During the combined treatment with the EHF-puncture and modern medicines, an overdosage effect can be observed.

COUNTERINDICATIONS

We consider, that only poor qualification of the doctor can be counterindication to apply EHF-puncture.

COMPLICATIONS

During application of EHF-puncture no complications caused by MM EMR were observed. Nevertheless, a wrong diagnosis (TCM syndrome), an inadequate treatment (for example, the "Excess" syndrome treated with reinforcing method, the "Deficiency" syndrome treated with reducing method)may give rise to a development of an acute form of the disease, a growth in intensity of the usual complaints and even some new complaints.

CONCLUSION

Hence the EHF-therapy with individualized selection of the irradiation acupoints according to TCM syndromes approach is a new and effective method for curing various diseases including those diseases for which the aspects of aetiology and pathogenesis have not yet been solved, where the nosologic diagnosis is difficult and where the modern methods of examination and treatment have not been developed[25].

We consider that EHF-puncture could be one of the therapeutic method which may help patients suffering from AIDS.

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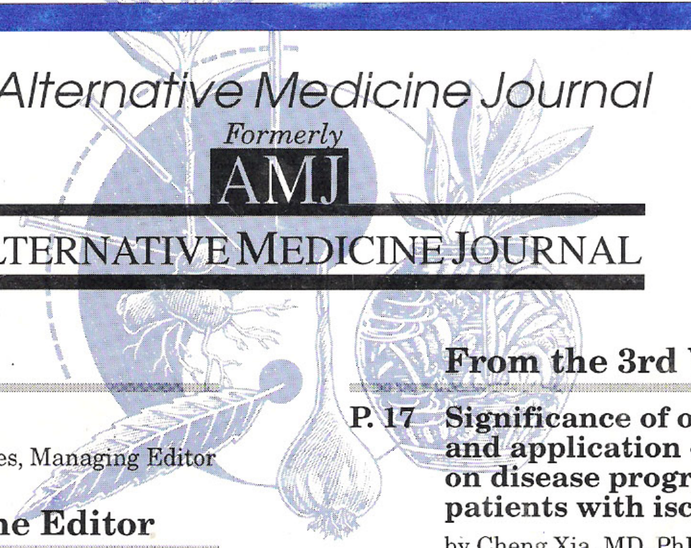

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Extremely high frequency (EHF) therapy

Mikhail Teppone
Larisa Novikova
Sergey Grigoriev
Romen Avakian

Keywords: Extremely High Frequency, microwave resonance

Abstract

Extremely High Frequency (EHF) Therapy is a new method of treatment which is based on different biological effects of low intensive electromagnetic radiation of millimeter band. Various aspects if this new therapeutic modality are described. Authors divide EHF-therapy into three independent branches: Microwave Resonance Therapy (MRT), Extremely High Frequency (EHF) Puncture, and Extremely High Frequency (EHF) Therapy. Indications, counterindications and side effects have been presented.

EHF-Therapy as a new method of treatment

Extremely High Frequency (EHF)-therapy, or MM-therapy, is a new method of treatment, based on the different biological effects of low power level of electromagnetic radiation (EMR) in the millimeter (MM) band.[1-8]

This method of treatment had proved its high efficacy in treating various diseases, including peptic ulcer, gastric polyps, bronchial asthma, high blood pressure, infantile cerebral paralysis, diabetic angioneuropathies, chronic alcoholism, Perthes disease, and others. It can be used alone or as adjunct to medicinal, X-ray, and physiotherapy, before and after surgery.[1-8]

The first investigations on the biological effects of MM-EMR began in the USSR in the middle of the 1960s.[9] Since that time, EHF-therapy has moved from theoretical and experimental works to the clinical application. Throughout the former Soviet Union, regular EHF-therapy seminars and conferences are organized; books and journals on the topic are published; and doctors are taught the therapy at special courses.

Physical aspects of EHF-radiation

Millimeter radio waves are considered EHF. On the EMR spectrum, EHF resides between centimeter radio waves and infrared waves and includes frequencies from 30 to 300 GHz or wavelengths from 120.0 to 1.0 mm. (Figure 1).

Extremely High Frequency (EHF) Therapy is a new method of treatment which is based on different biological effects of low intensive electromagnetic radiation of millimeter band.

However, the literature on EHF-therapy only reports results obtained during application of 30.0 - 120.0 GHz radiation only. The usual consideration is that the most significant biological effects have been obtained at the frequencies which corresponded with the oscillations of oxygen and water molecules.[10-12]

EHF application is of *coherent* radiation when all waves have the same frequency and phase. *Noise* exists when there is an axis frequency and included zones of radiation on the either side of this central frequency. (Figure 2).

Generally, the applied power of this radiation does not exceed 1.0-10.0 mW.

The depth of the MM EMR penetration into the living tissue and skin

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Mikhail Teppone, Moscow, Russia.
Larisa Novikova, Moscow, Russia.
Sergey Grigoriev, Moscow, Russia.
Romen Avakian, Moscow, Russia.

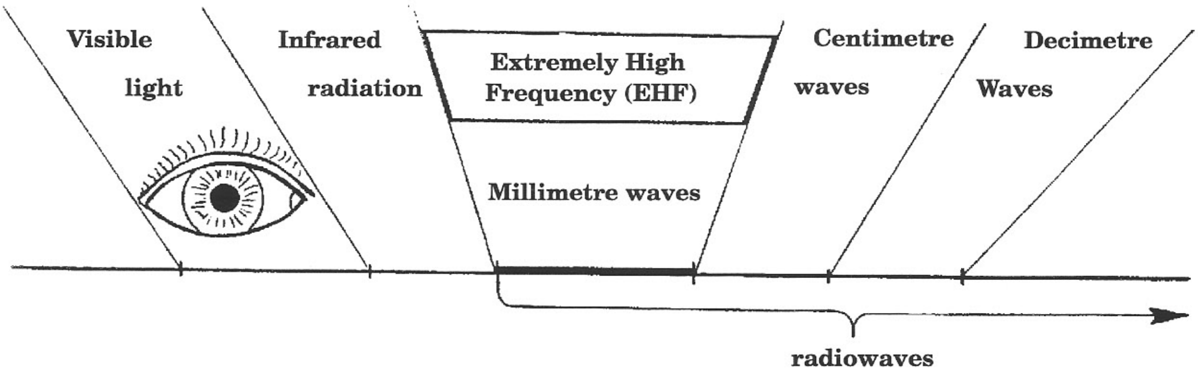


Figure 1. The scale of elctromagnetic radiation

is not more than 0.2-0.5 millimeters.

Hypotheses which explain EHF biological and therapeutic effects

Theory of N. Deviatkov, Academician of Russian Academy of Sciences, and Professor M. Golant.

Homeostasis is connected with an organism's cell field generation in the EHF band. The amplitude-frequency responses of radiation from healthy and unhealthy organisms are different as pathology differs from healthy cells. Outside EHF-radiation (from the EHF-producing apparatus) imitates EHF self-radiation of the organism. Through the treatment process, the organism fulfills the functions of the synchronizing apparatus and restores the healthy rhythm, lost when during illness. Initial events take place in cell membranes, where the acoustic-electrical waves are formed. Temporary structure elements appear which exit when the cells restore their normal functions. Information transfer to the whole organism is accomplished through the intercellular interaction and the nervous system. Thus EHF-therapy functions to mobilize organism reserves.[13-14]

Theory of Professors O. Betskii, I. Petrov and Yu Khurgin.

The initial molecular target of the EHF-radiation are water molecules within the organism. The interaction between water molecules and macromolecules (*e.g.*, albumin) leads to the appearance of the functionally active configuration of the macro-molecules. The therapy generates physical and chemical processes added to the general metabolic system, and normalizes vitally important cell functions. Secondary effects may include changing the activity of the ATP synthesis of different regulation systems. The final biological and therapeutic effects depend on the reactions of the neural, endocrine, immune, cardiovascular, and other systems of the macro-organism.[15-16]

Theory of Professor S. Sitko.

Professor Sitko believes every living organism has its own "characteristic frequency." A sick organ or organism interacts with these "resonance" frequencies to restores its homeostasis. EMR can spread through the living organism by means of "channel-point" system known from Chinese acupuncture (Figure 3).[8,10,17]

Biological effects observed during EHF-therapy

Analysis of the literature dealing with the EHF makes it possible to specify several types of the effects appearing during EHF-influence:

Specific effects associated with the frequency of MM-EMR

All aforementioned hypotheses point to the "resonance" nature of the interaction between artificial MM EMR and bio-objects. Various experiments have supported this theory. EHF-radiation can result in the accelerations of the active transport of ions Na+; in the variation of the membrane penetrability of erythrocytes for K+ ions; and in the acceleration of the peroxide oxidation of the unsaturated fatty acid in liposmata, etc. The frequency dependence of the biological effects was a peculiar experimental fact revealed at millimeter wave radiation of various macromolecules and micro-organisms. Later investigations revealed "resonance" hemoprotective effect of EHF-influence before application of the lethal dose of X-ray or chemo-

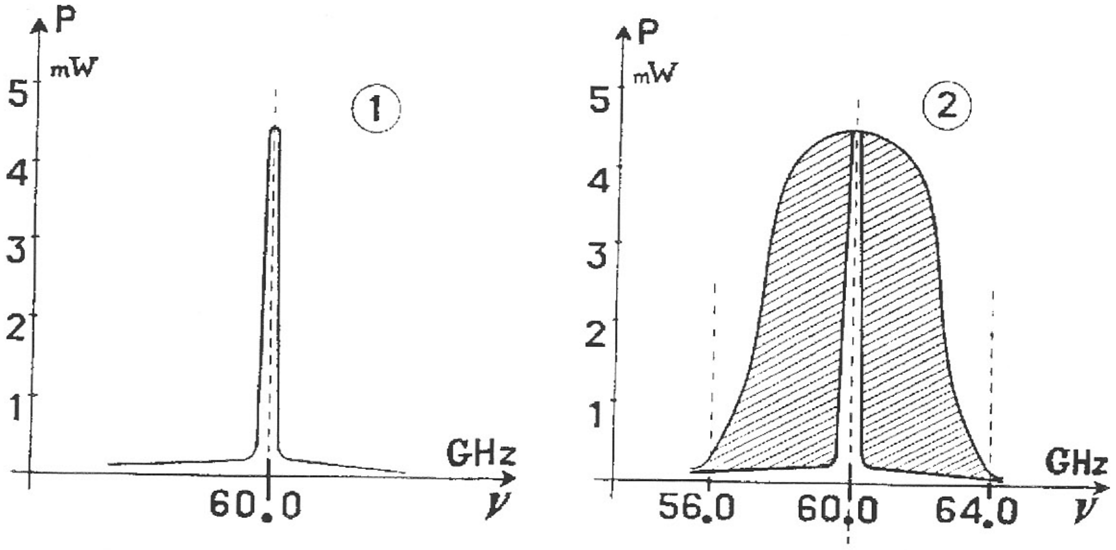


Figure 2. Coherent radiation (1) and "noise" (2)

therapy medicines. Therapeutic application of MM-EMR leads to suggest that the human body has its own "characteristic" or "resonance" frequencies.[10,17-20]

Non-specific effects associated with the irradiated zone

Other researchers have concluded that the irradiated zone did not play any role if "resonance" frequency was used.[21] However, contrary results were observed in other experiments. If the right side of the rats were irradiated, mineralcorticoid effects were achieved. However, if the left side received the treatment, glucocorticoid effects were realized.[22] If the location of the irradiated zone was changed, it was also necessary to change the frequency of MM-EMR to achieve hemoprotective effect.[19,20] During EHF-influence upon biosystems of different complexity, it was shown that different signals spreading from the irradiated place bore the certain information about place of irritation only.[23] Clinical experiments revealed necessity to individualize the irradiated zone-acupoint.[24]

Non-specific effects conditioned by developing the General Adaptation Syndrome (GAS)

In accordance with the theory of the GAS by H. Selye, if any new factor influences upon a bio-object, the organism initiates the GAS to protect the itself from this factor and prevent it from dying. At the same time, the organism builds up a specific adaptation syndrome to the new factor and GAS subsides.[25]

Naturally occurring EMR of MM band is absorbed by the atmosphere almost completely and does not reach the surface of the Earth. Therefore organisms have not experienced the effects of such waves.[10-12] Therefore, MM-EMR is indeed a "new" factor for every living organism.

Comparing neuroendocrine mechanisms of GAS (energetic, structural and immune aspects of the resistance)[26,27] with the results of experimental and clinical works on EHF-influence,[28-30] it becomes apparent that during EHF-therapy, GAS is frequently initiated.

Versions of EHF-therapy

Three types of the biological effects appeared during EHF-influence to determine three versions of EHF-therapy: 1) EHF-therapy with individual frequency of MM-EMR, 2) EHF-therapy with individual irradiated zones, 3) EHF-therapy without individualization frequencies as well as irraidated zones.

EHF-therapy with individual frequency of MM EMR or Microwave Resonance Therapy (MRT)

The hypothesis about an organism's own "characteristic frequencies" was the basis of this version of EHF-therapy. During the first procedure of the treatment, a doctor influenced a patient's acupoint by means of MM-EMR. Frequencies of the ra-

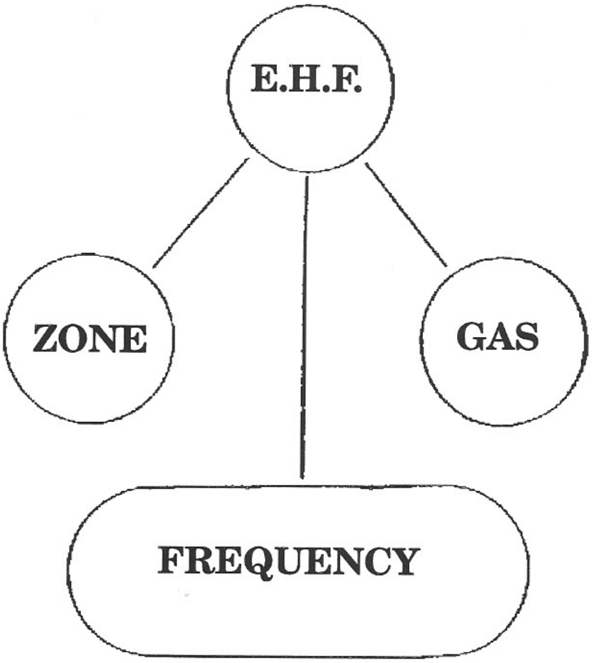


Figure 3. Bioeffects appearing during EHF-influence

diation were then adjusted and the sensory reactions of the patient observed. Usually patients had sensations of warmth or coolness, or a feeling of waves or something creeping. Some felt these sensations localized to a certain region; others felt the sensation moving along the extremities or trunk. Some of the patients had exhibited changes in their emotional condition. The comfortable sensations appearing at the place the "sick organ" served as a criterion for individualization of the therapeutic frequency. During the sensory reactions, the changes of the functional activity of different organs were observed by means of electrocardiograph, electroencephalograph, electrogastrograph, and heat monitor, etc.[10,31-33]

EHF-therapy with individual irradiated zone or EHF-puncture

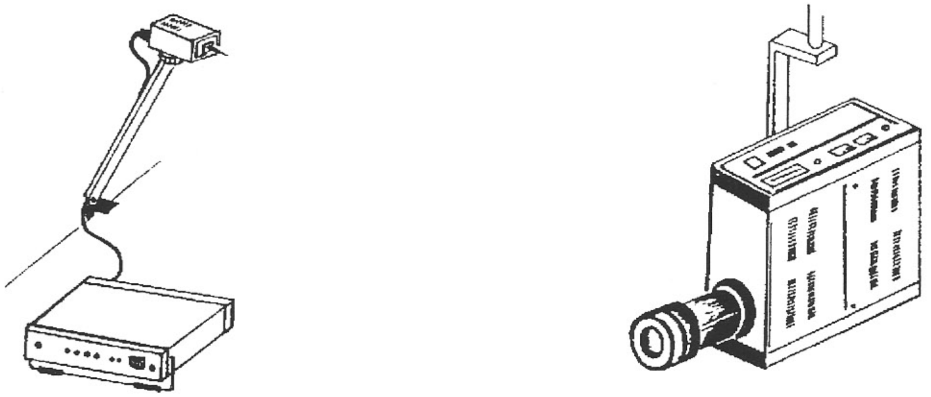
Some treatments have utilized the application of MRT or EHF-therapy with individual frequency.[34] To investigate the phenomenon of sensory reactions during EHF-therapy, the temperature at the skin projections of acupoints was monitored and it was revealed that sensory reactions were accompanied by changes of the temperature at the affected acupoints. Subsequent research showed sensory reactions occurring during MRT were the same as the phenomenon of "Arrival of Qi," known from Traditional Chinese Medicine (TCM).[35]

Adequate evidence exists to show it is the zone-acupoint to which the radiation was applied during EHF-therapy which enhances the treatment and not the MM-EMR frequency.[23,24,36] The frequency determined the likelihood of MM-EMR being absorbed by the water-containing structures of the skin, *i.e.* the absorption and reflection, and hence, the intensity of irritation of the stimulated zone.[15,37] The end-non-specific effects of EHF-therapy were realized through the participation of various regulator systems of macro-organism.[23]

> *The combination of different biological effects of MM-EMR and acupuncture theory of TCM resulted in the procedure known as extremely high frequency (EHF) puncture.*

If acupoints had been hypersensitive to MM-EMR, it was apparently due to the high tissue hydration of acupoints.[10,38] Individualization of acupoints was the most effective according to the principles of Traditional Chinese Medicine.[39,40] The diagnosis, arrived at through TCM, determined selection of acupoints, duration of the EHF-influence, and length of the procedures.

The combination of different biological effects of MM-EMR and acupuncture theory of TCM resulted in the procedure known as *extremely high frequency* (EHF) *puncture*.[34,41]



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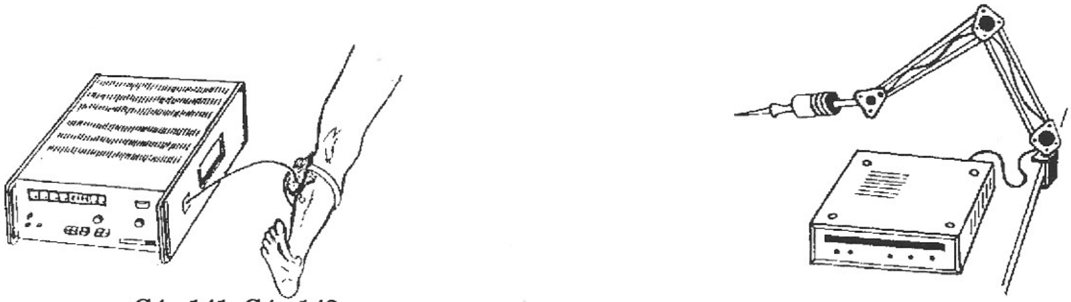

G4 - 141, G4 - 142

Artsakh

Figure 4. Devices for Extremely High Frequency Therapy

EHF-therapy without individualization frequencies of MM EMR as well as irradiated zone

When this version of EHF-therapy was developed, it was focused on the "resonance" mechanism of the interaction between MM-EMR and bio-objects.[13,14,21] However, they applied only two or three frequencies: 42.19 GHz (7.1 mm), 53.53 GHz or 60.12 GHz (4.9 mm). Sometimes during the whole course of treatment, only one frequency was applied, but in other cases, several (two to three) frequencies were used in turn or in combination. "Individualization" of these frequencies was carried out on the basis of modern nosological diagnosis or on the basis of results obtained through EHF-influence upon blood cells *in vitro*.[42]

Usually, the skin of the Zakharyin-Ged's zones, bug joints, sternum, epigastrium, or occiput was irradiated.[43] The course of treatment consists of 10, 15, or 20 procedures for durations of 15, 30, or 60 minutes.

During this version of EHF-therapy, the GAS effects played the main role. Therefore, individualization of the treatment was based on the controlling the adaptation reactions of the organism.[44]

Device for EHF-therapy

At the beginning of the experimental and clinical works, technical generators of coherent MM waves G4-141 (with frequencies of 37.75-53.57 GHz) and G4-142 (53.57-78.33 GHz) were used.

In later investigations, special medical devices of coherent and "noise" MM radiation, providing modulation and sweeping, and equipped with dielectric waveguide or horn antenna were devised and manufactured. (Figure 4).

Every version of EHF-therapy requires specific apparatus.

For individual frequency EHF-therapy, a broad stripe generator—with changeable MM-EMR frequencies—is necessary. It also must be able to initiate sensory reactions on the certain frequency, which is accepted as a "resonance" frequency (G4-142, "Ariya," MRT, etc.).[7,10]

For EHF-therapy with individual irradiated zone-acupoints (EHF-puncture), generators with coherent or "noise" radiation and with dielectric waveguide usually are applied. Sensory reactions must appear during influence upon any selected acupoint (G4-142, "Ariya," MRT, "Artsakh," "Solition," "Electronica-EHF," etc.).[7,34-35,45-46]

EHF-therapy without individual frequencies of MM-EMR as well as individual irradiated zone requires generators with horn antenna. "Yav-I" (5.6 mm and 7.1 mm), "Yarmeka," "Shlem," and "Baiur" devices are generally used.[47-50]

Further device specialization for EHF-therapy incorporates several variations:

- Broadening and heightening of the applied frequencies(100.0-120.0 GHz and higher).[51,52]
- Multi-channel devices for simultaneous influence upon several acupoints.[53]
- Combined application of EHF, laser, or infrared radiation.[54]
- Diagnostic-therapeutic complexes.[55-56]
- Portable device for EHF-therapy.[57]

Indications

Exact indications have yet to be established, due to the continuing development of new nosological forms. EHF-therapy has shown promise of high efficacy in the treatment of various forms of disease of the digestive, respiratory, cardiovascular and neural systems, and as well as several different syndromes and symptoms.

Counterindications

MRT should not be used for conditions requiring surgery, or during pregnancy, and menses.[7]

For EHF-puncture, absolute counterindications have not been observed. Diminished benefits have been seen in patients with a history of surgical interventions.[34]

EHF-therapy without individualism frequency and irradiated zone should be applied cautiously in cases of bronchial asthma, vegetal-vessel disturbance, and high blood pressure exhibiting frequent crises.[58]

Side-effects

During application of MRT no side-effects have been revealed.[7]

> *Present experience strongly suggests EHF-therapy will be divided into three independent branches: Microwave Resonance Therapy (MRT), Extremely High Frequency (EHF) Puncture and Extremely High Frequency (EHF) therapy (the third version of EHF-therapy)...*

During application of EHF-puncture no side-effects attributable to MM-EMR were observed. Nevertheless, a wrong diagnosis (TCM syndrome) or an inadequate regimen of treatment may give rise or aggravate some symptoms of disease.[34]

Urticaria was observed several times when EHF-therapy, without individualization of both the frequency and the irradiated zone, was applied in conjunction with medicinal therapy.[59]

Conclusion

EHF-therapy is a result of successful collaboration of scientists from the various field of physics, biology, and medicine. Ongoing investigations should be undertaken to reveal and understand all mechanisms which underlie biological and therapeutic effects of this new medicinal modality. Present experience strongly suggests EHF-therapy will be divided into three independent branches: Microwave Resonance Therapy (MRT), Extremely High Frequency (EHF) Puncture and Extremely High Frequency (EHF) therapy (the third version of EHF-therapy), and each modality will assume a role in modern medicine.

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are exposed to rain and wind. A further point is to avoid living in houses which are damp or to live in areas where damp conditions abound, for example, near streams or swamps.

2. Pay attention to diet

I think that most Chinese and Europeans would agree with me when I say that in the west there is an overconsumption of milk and milk products, meat, alcoholic beverages, coffee and sweets. All these foodstuffs produce heat and may impair the spleen and stomach, thus attracting an invasion of wind, damp and heat. This in turn, leads to heat Bi or transformation of cold Bi to heat Bi. At the same time, westerners also consume too many raw, uncooked, cold foods which may impair the yang of the spleen and stomach, which leads to formation of cold damp. This leads to cold Bi and damp Bi. TCM practitioners are therefore asked to always advise their Bi syndrome patients with regard to diet; the above-mentioned food and beverages should be avoided.

3. Maintain a regular lifestyle

This involves keeping regular working hours, resting periods and mealtimes. An irregular lifestyle not only disturbs qi and blood circulation, it also decreases defensive qi and damages the zang fu organs. The thus-weakened organism is then more open to any attack by a pathogenic factor and Bi syndrome may result. Most westerners, especially those who are self-employed, are overworked, have no daily routine for resting and relaxing and no regular mealtimes. As their body resistance is diminished, painful conditions may develop. However, there are many other persons who feel that relaxation consists of sitting in front of the television or visiting friends or doing housework; these activities are not restful and can also lead to *qi* and blood circulation disorders.

4. Learn to cope with emotional upsets

According to TCM theory, all emotions can disturb qi and blood circulation and cause zang fu organ dysfunctions. Among these emotions, anger, frustration and stress attack mainly the liver, in turn causing *qi* stagnation in the meridians and organs. In addition, over-thinking blocks the spleen, which causes the creation of damp. Damp can later also obstruct the meridians and organs. But how can anyone avoid emotional upsets? Probably the best way to deal with them when they occur is to take time off, even a short holiday, following a period of intense stress or emotional upheaval. Another way is to have open and deep conversations with one's friends; however, in the fast-paced western world, I have found that most persons have very little time to find and cultivate good friendships, and that the small amount of social contact which westerners do have is usually superficial. This leads to social isolation, so most persons are unable to express their emotions.

5. Do exercise

Chinese pensioners and old persons practise tag Wushu, QiGong, animal dancing and other exercises in order to remain mobile. This type of exercise promotes *qi* and blood circulation, thus improving immune resistance and preventing disease. From the TCM point of view, too much sport and no physical activity disturbs life; the former damages the tendons and bones and consumes too much energy, the latter causing retardation of qi and blood circulation, and ultimately, Bi syndrome. It is very important that older persons exercise regularly so as to maintain an easy flow of qi and blood circulation. Those younger persons who have sedentary jobs should exercise frequently.

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Sun Pei-lin graduated as a doctor in TCM from the Suzhou Medical Academy, later practising at the Yang Zhong People's Hospital and at the Nanjing College of TCM and at the International Acupuncture Training Centre in Nanjing. He is in private practice in Ghent (Belgium).

The S

The first report on acupuncture in Russia was published in 1828 in the *Military Medical Journal* by P. Charukovsky, a professor at the Medical-Surgical Academy (Charukovsky, 1828)but no real interest in the practical application of acupuncture was shown until the mid-1950s. At this time, a group of physicians went to China to study acupuncture and Chinese herbal medicine. By 1976, a special Central Research Insitute of Reflexotherapy was created in Moscow. In present-day Russia, there are several universities which have departments of traditional Chinese medicine or acupuncture, most of them being housed within the departments of neurology; this is due to the fact that Pavlov's reflexological theories continue to be the official explanations tfor the biological and therapeutic effects of acupuncture (Kipervas, 1994). Throughout Russia, acupuncture or traditional Chinese medicine seminars and conferences are regularly held; there are numerous books and several journals on these topics, and physicians are taught acupuncture at special courses.

Various forms of traditional medicines are presently taught in Russia; these include not only aspects of Chinese medicine (acupuncture, herbal medicine, Tai Qi Chuan, Qi Gong) but also Korean traditional medicine (Su Kok or "Hand and Foot Acupuncture"), but Indian medicine as well (Ayurveda and Yoga). However, acupuncture can only be practised by western-trained physicians. Officially-recognized courses in acupuncture are offered at the state medical universities or institutes and these comprise three months of lectures, seminars and practical sessions at the end of which, a final exam must be passed in order to obtain a certificate in acupuncture. Most of these courses pay a great deal of attention to the localization of acupoints and trajectories of the channels, but only a few teach traditional Chinese medical

tate of Acupuncture in Modern Russia

Article by **Mikhail Teppone**

theory and diagnosis, including taking of the pulse.

The indications for acupuncture treatment in Russia are various and depend on the interests and skills of the individual physicians. However, Russian law forbids administering acupuncture instead of conventional medical treatment to treat cancer, surgical conditions or infectious diseases. Nevertheless, there is no enforcement of this rule in treating patients during the terminal phases of disease.

Present research into acupuncture is directed to reveal and understand the mechanisms which underlie the biological and therapeutic effects of this technique. Questions such as: how does acupuncture influence the immune status? how does it affect hormone, prostaglandin and endorphin plasma levels? can the effects be measured using heat monitors? are currently addressed by Russian researchers (Vogralic, 1988; Runov, 1993).

In addition to the classical acupuncture and moxibustion techniques, new modalities, such as electro-acupuncture, laser acupuncture, ultrasonic acupuncture and Voll's therapy, sometimes with other treatments, such as homoeopathy, are used. New methods of acupuncture are being developed; since the mid-1980s to date, two new methods - microwave resonance therapy (MRT) and extremely high frequency puncure (EHF)- based on the theories of biological effects of low intensity electromagnetic radiation (EMR) of a millimeter band, have been created (Andreyev, 1985; Teppone, 1991; 1996).

The basis of MRT is the hypothesis that each organism has its own characteristic frequency. During the initial MRT treatment, the therapist can affect the patient's acupoints by means of MM-EMR. Radiation frequencies are then changed and the patient's sensory reaction are observed and noted. Any pleasurable sensation appearing at the target or "sick" organ serve as the criteria for individualization of the therapeutic frequency used; this particular frequency is then applied throughout the entire course of treatment.

In order to investigate the phenomenon of sensory reactions during EFH therapy, the temperature at the skin projections of acupoints was monitored; we found that sensory reactions were accompanied by temperature changes at the acupoint of the channels corresponding to these sensory reactions. Subsequent research found that sensory reactions occurring during MRT were the same as the "arrival of Qi" as described in traditional Chinese medicine texts (Teppone, 1995). An additional study revealed that it was the zone-acupoint where the radiation had been applied during EHF therapy which enhanced the treatment and not the MM-EMR frequency (Teppone,Vetkin, Kalin and Krotenko 1991). Individualization of acupoints was most effective, in accordance with TCM principles (Kostianov, 1994).This combination of different biological effects of MM-EMR and TCM acupuncture theory resulted in the creation of EHF puncture (Teppone,Vetkin and Krotenko 1991).

I believe that EFH successfully integrates modern technology and ancient theory. It is a non-invasive, painless and very efficient treatment for many diseases of the respiratory, gastrointestinal and cardiovascular systems. One of the important features of EHF puncture is its capacity to stimulate different kinds of "arrival of Qi" phenomena ranging from propagated sensations along the channels to complex visceral sensations including visualizations and dreams.

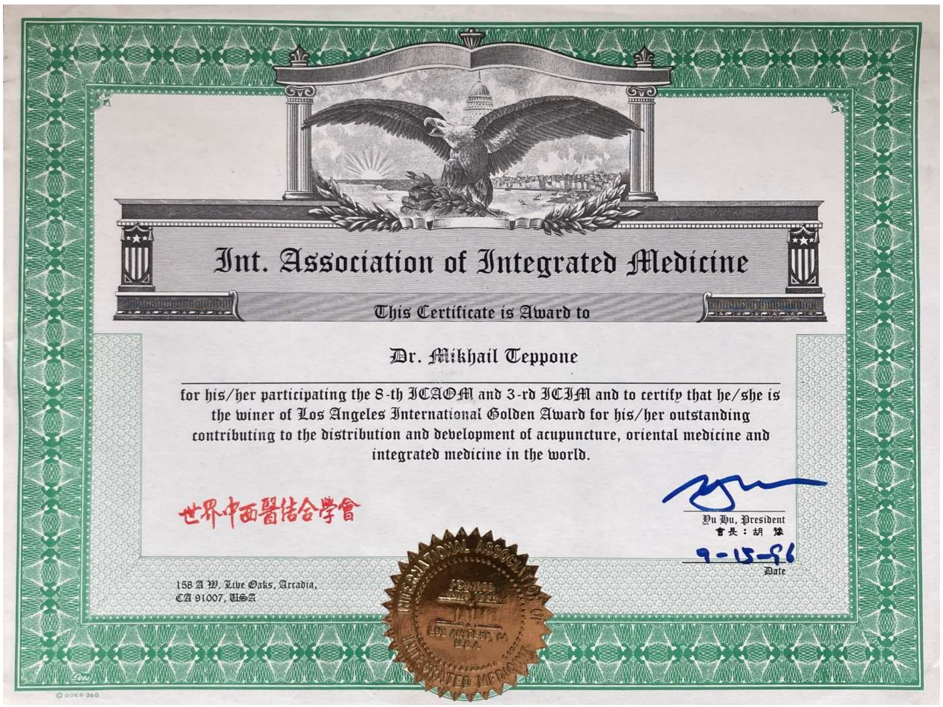
The present day state of acupuncture in modern Russia confirms the idea that the past and the future remain connected- an ancient knowledge has helped us devise new methods of treatment, but at the same time, modern technology has thrown new light on old problems.

Mikhail Teppone, MD, an internal medicine specialist, was born in Leningrad and is currently practising and researching acupuncture in Moscow. From 1987 to 1991 he worked at the USSR Academy of Sciences investigating the medical application of low intensity electromagnetic radiation of the MM band. Dr. Teppone is credited with the discovery of EHF acupuncture. He was elected Founding Director of the International Association of Integrated Medicine last year in Los Angeles.

Extremely High Frequency (EHF) Puncture: A Successful Integration of Ancient Theory and Modern Technology

M.Teppone, R.Avakian

The 3rd International Conference of Integrated Medicine (ICIM)
September 13-15, 1996, Los Angeles, USA



Int. Association of Integrated Medicine

This Certificate is Award to

Dr. Mikhail Teppone

for his/her participating the 8-th ICAOM and 3-rd ICIM and to certify that he/she is the winer of Los Angeles International Golden Award for his/her outstanding contributing to the distribution and development of acupuncture, oriental medicine and integrated medicine in the world.

世界中西醫结合學會

Yu Hu, President
會長：胡 豫

9-15-96
Date

158 A W. Live Oaks, Arcadia,
CA 91007, USA

=> See: # 43

EHF – Puncture: Integration of East and West Modern Diagnostic & Therapeutic Microwave Equipment.

M.Teppone, R.Avakian, A.J.Scott–Morley

The 5th International Congress of Traditional Medicine & Acupuncture,
Singapore, March 18-19, 2000 pp. 81-87
https://archive.org/details/integration-ehf-tcm-singapore

Therapeutic application of MM waves

M.Teppone, R.Avakian

Trans Black Sea Region Symposium on Applied Electromagnetism
17-19 April, 1996, Hellas, Greece, p. 14. DOI:10.1109/AEM.1996.872890;
https://ieeexplore.ieee.org/document/872890
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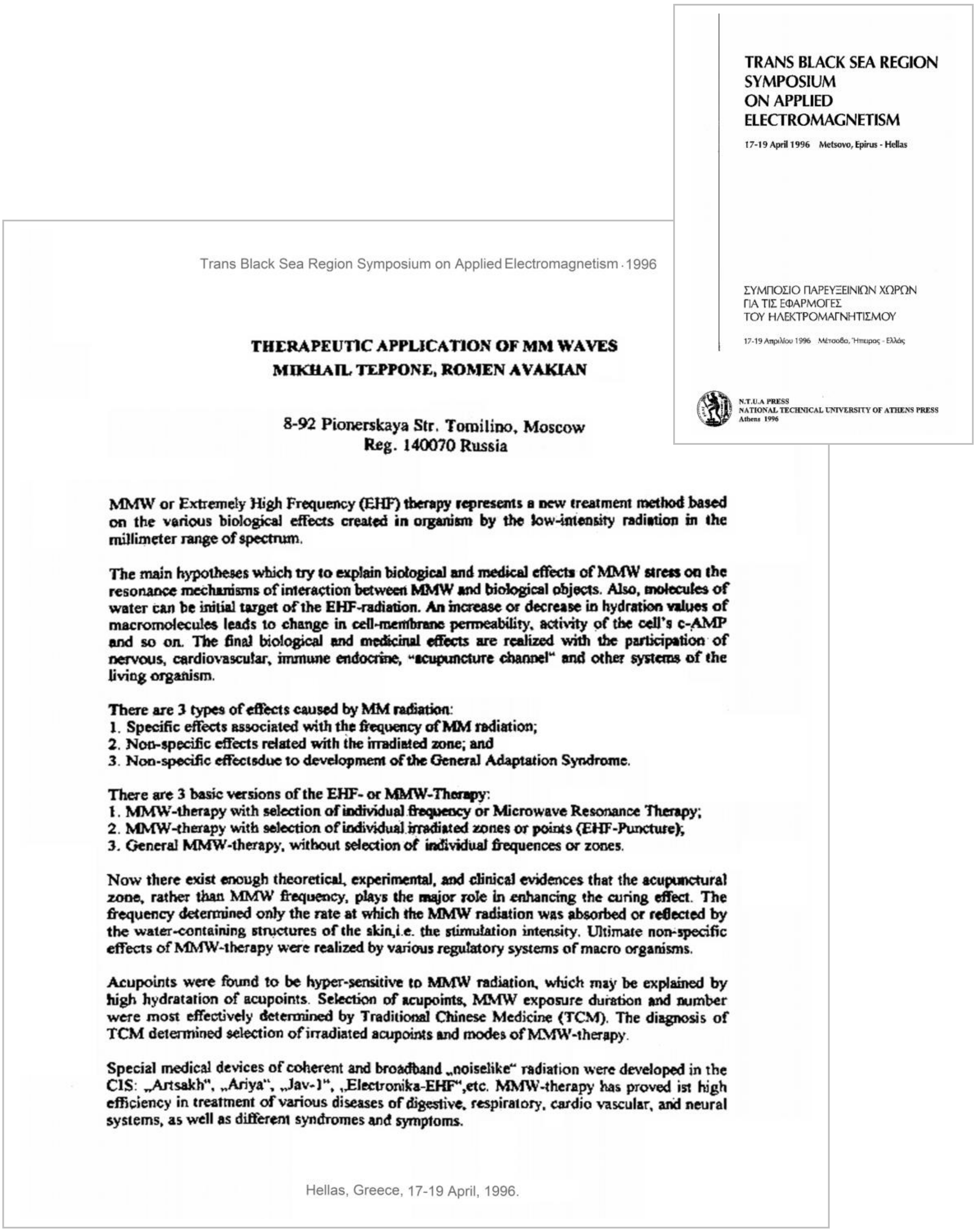

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Athens 1996

Trans Black Sea Region Symposium on Applied Electromagnetism . 1996

THERAPEUTIC APPLICATION OF MM WAVES
MIKHAIL TEPPONE, ROMEN AVAKIAN

8-92 Pionerskaya Str. Tomilino, Moscow
Reg. 140070 Russia

MMW or Extremely High Frequency (EHF) therapy represents a new treatment method based on the various biological effects created in organism by the low-intensity radiation in the millimeter range of spectrum.

The main hypotheses which try to explain biological and medical effects of MMW stress on the resonance mechanisms of interaction between MMW and biological objects. Also, molecules of water can be initial target of the EHF-radiation. An increase or decrease in hydration values of macromolecules leads to change in cell-membrane permeability, activity of the cell's c-AMP and so on. The final biological and medicinal effects are realized with the participation of nervous, cardiovascular, immune endocrine, "acupuncture channel" and other systems of the living organism.

There are 3 types of effects caused by MM radiation:
1. Specific effects associated with the frequency of MM radiation;
2. Non-specific effects related with the irradiated zone; and
3. Non-specific effectsdue to development of the General Adaptation Syndrome.

There are 3 basic versions of the EHF- or MMW-Therapy:
1. MMW-therapy with selection of individual frequency or Microwave Resonance Therapy;
2. MMW-therapy with selection of individual irradiated zones or points (EHF-Puncture);
3. General MMW-therapy, without selection of individual frequences or zones.

Now there exist enough theoretical, experimental, and clinical evidences that the acupunctural zone, rather than MMW frequency, plays the major role in enhancing the curing effect. The frequency determined only the rate at which the MMW radiation was absorbed or reflected by the water-containing structures of the skin,i.e. the stimulation intensity. Ultimate non-specific effects of MMW-therapy were realized by various regulatory systems of macro organisms.

Acupoints were found to be hyper-sensitive to MMW radiation, which may be explained by high hydratation of acupoints. Selection of acupoints, MMW exposure duration and number were most effectively determined by Traditional Chinese Medicine (TCM). The diagnosis of TCM determined selection of irradiated acupoints and modes of MMW-therapy.

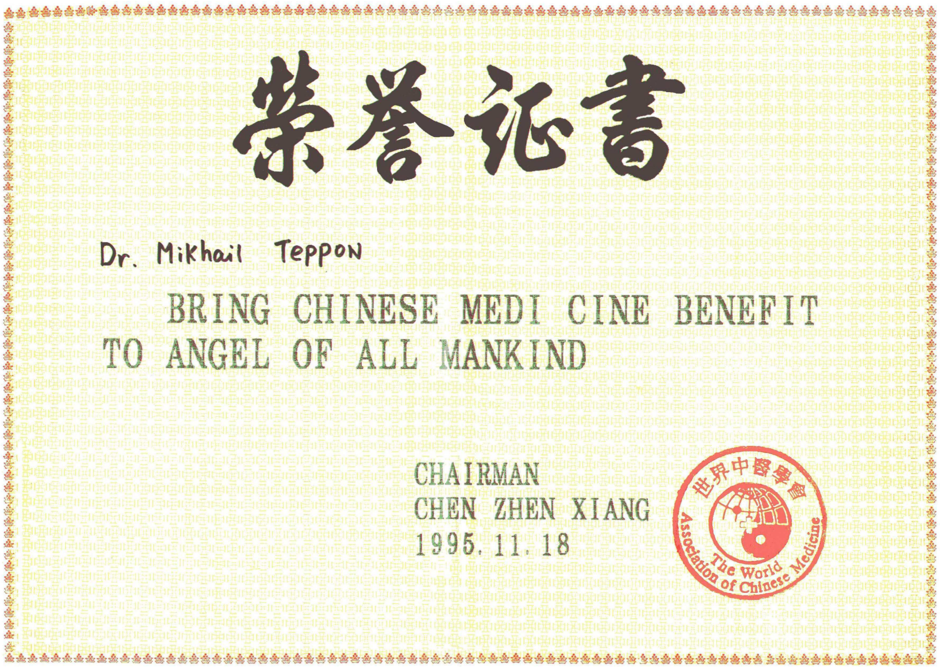
Special medical devices of coherent and broadband „noiselike“ radiation were developed in the CIS: „Artsakh“, „Ariya“, „Jav-1“, „Electronika-EHF“,etc. MMW-therapy has proved ist high efficiency in treatment of various diseases of digestive, respiratory, cardio vascular, and neural systems, as well as different syndromes and symptoms.

Hellas, Greece, 17-19 April, 1996.

Specific Sensations ("De Qi" or "Teh Chi" Phenomenon) During Extremely High Frequency (EHF)-Puncture

M.Teppone

The 3rd International Congress of Chinese Medicine & Acupuncture
November 18-19, 1995, Singapore, (Congress Handbook), p. 195-196



荣誉证書

Dr. Mikhail Teppon

BRING CHINESE MEDI CINE BENEFIT
TO ANGEL OF ALL MANKIND

CHAIRMAN
CHEN ZHEN XIANG
1995. 11. 18

世界中醫學會
The World Association of Chinese Medicine

See # 40

Phenomenon of “De Qi” or Sensory reactions during EHF-Puncture

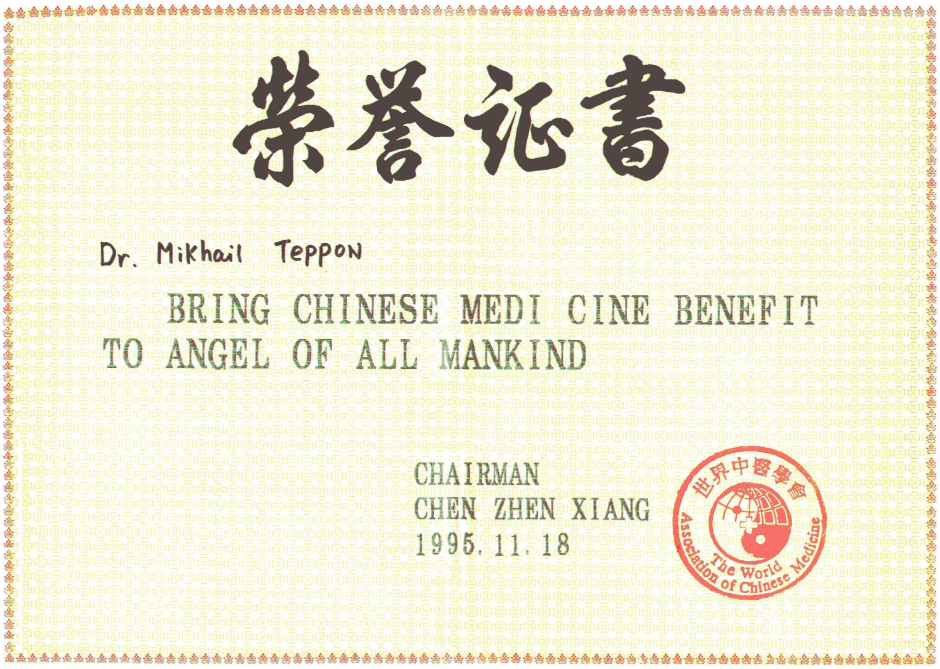
M.Teppone, R.Avakyan, I.Karneev,

The 1st International Symposium “Quantum Medicine and New Medical Technologies”,
November 17-22, 2001, Bled, Slovenia, pp. 116-118
https://archive.org/details/arrival-of-qi-phenomenon-ehf

LUO-Meridians (Collaterals): A New Point of View on the Problem

M.Teppone

The 3rd International Congress of Chinese Medicine & Acupuncture
November 18-19, 1995, Singapore, (Congress Handbook), p. 218-219



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See # 51

Luo Vessels (collaterals): A new perspective

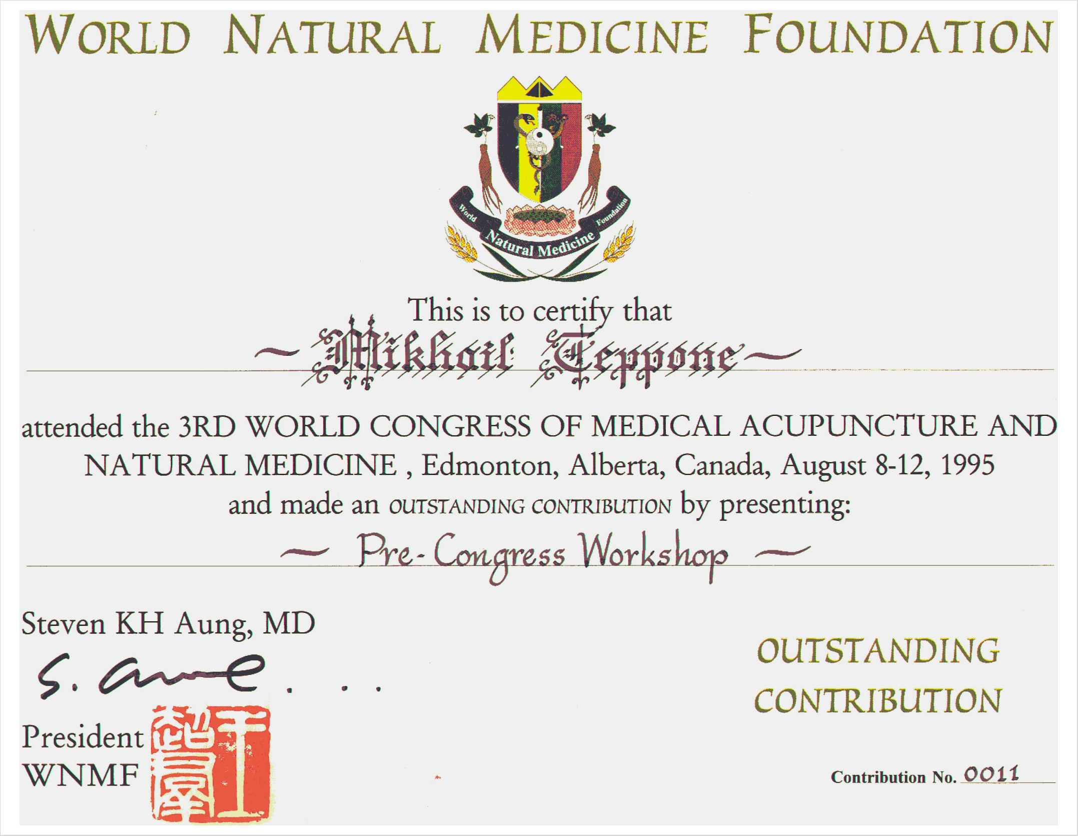
M.Teppone, L.Novikova

American Journal of Acupuncture, 1998; 26(2/3): 129-138
https://archive.org/details/luo-vessels

Extremely High Frequency (EHF) - Puncture

M.Teppone, S.Grigoryev, A.Krotenko

The 3rd World Congress of Medical Acupuncture and Natural Medicine
August 8-12, 1995, Edmonton, Canada (abstracts), p. 49
https://www.aung.com/health-integrated-medicine/acupuncture-a-traditional-chinese-medicine/world-congress



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This is to certify that

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attended the 3RD WORLD CONGRESS OF MEDICAL ACUPUNCTURE AND NATURAL MEDICINE , Edmonton, Alberta, Canada, August 8-12, 1995
and made an OUTSTANDING CONTRIBUTION by presenting:

~ Pre-Congress Workshop ~

Steven KH Aung, MD

President
WNMF

OUTSTANDING
CONTRIBUTION

Contribution No. 0011

=> See: # 43

EHF – Puncture: Integration of East and West Modern Diagnostic & Therapeutic Microwave Equipment.

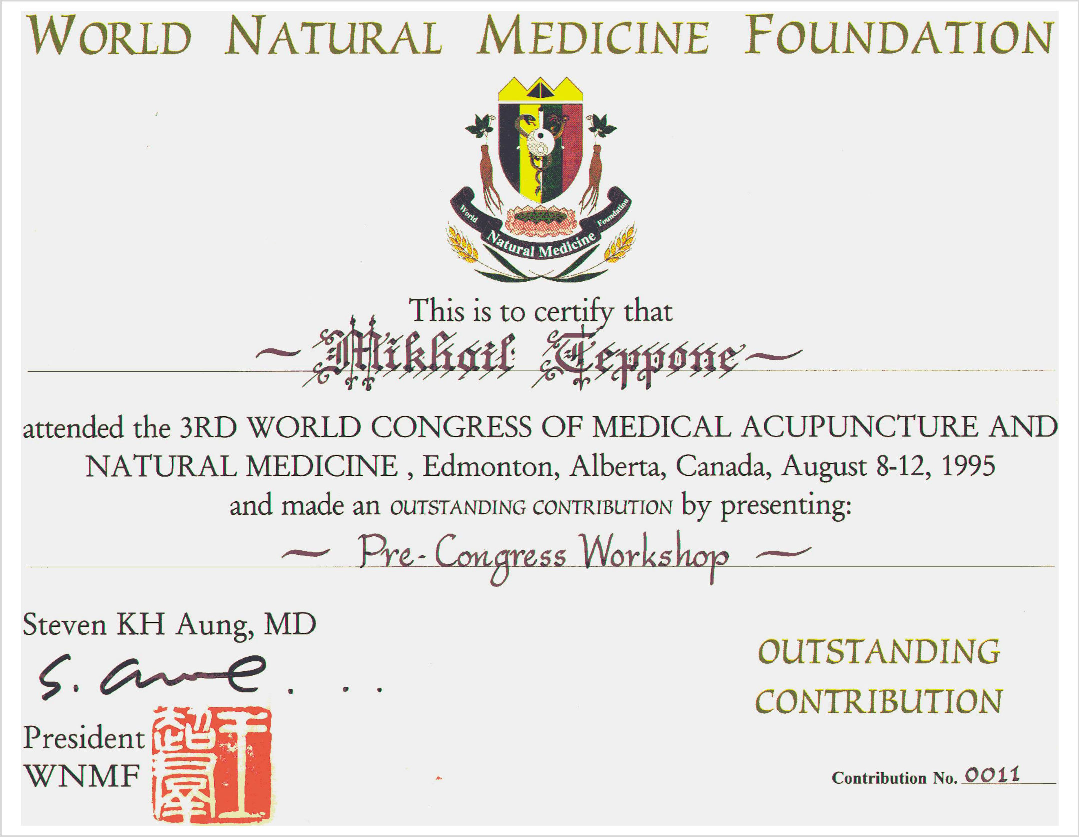
M.Teppone, R.Avakian, A.J.Scott–Morley

The 5th International Congress of Traditional Medicine & Acupuncture,
Singapore, March 18-19, 2000 pp. 81-87
https://archive.org/details/integration-ehf-tcm-singapore

Collaterals (Luo): New view and application

M.Teppone

The 3rd World Congress of Medical Acupuncture and Natural Medicine
August 8-12, 1995, Edmonton, Canada (abstracts), p. 73
https://www.aung.com/health-integrated-medicine/acupuncture-a-traditional-chinese-medicine/world-congress



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Steven KH Aung, MD

President
WNMF

OUTSTANDING
CONTRIBUTION

Contribution No. 0011

=> See: # 51

Luo Vessels (collaterals): A new perspective

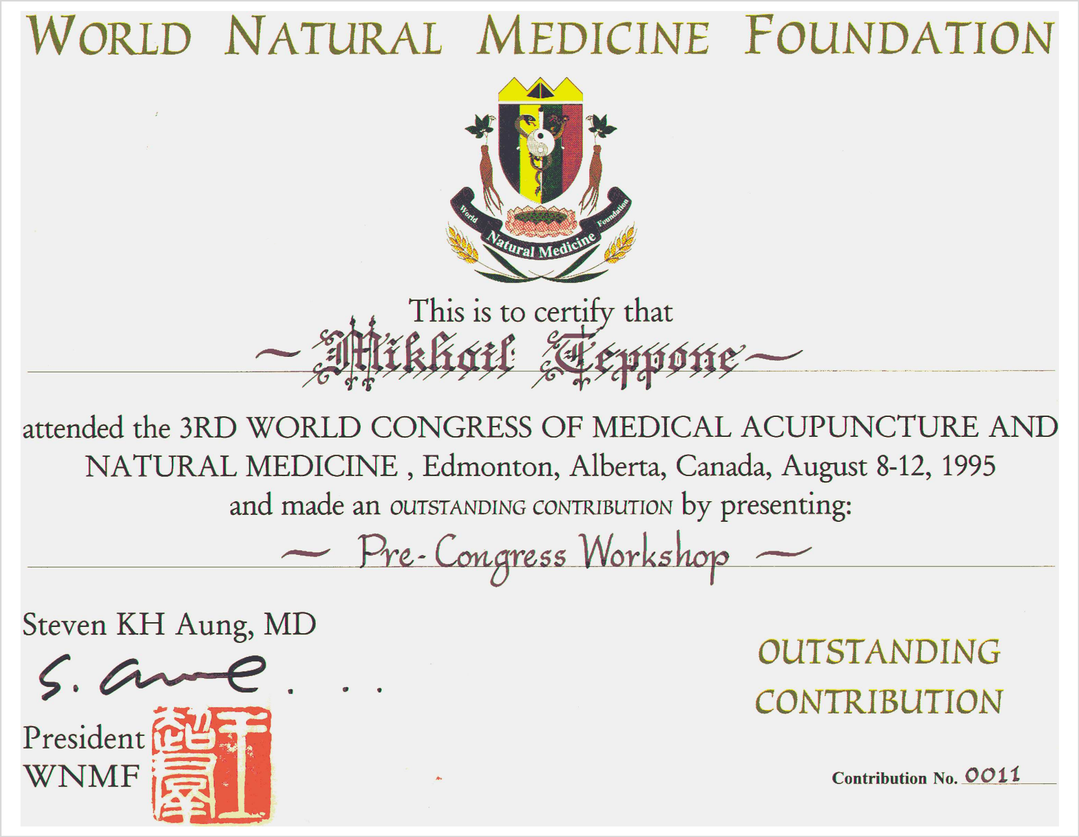
M.Teppone, et al.

American Journal of Acupuncture, 1998; 26(2/3): 129-138
https://archive.org/details/luo-vessels

Extremely High Frequency (EHF) - Puncture and the Phenomenon of De Qi

M.Teppone, A.Krotenko, S.Grigoryev

The 3rd World Congress of Medical Acupuncture and Natural Medicine
August 8-12, 1995, Edmonton, Canada (abstracts), p. 85
https://www.aung.com/health-integrated-medicine/acupuncture-a-traditional-chinese-medicine/world-congress



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attended the 3RD WORLD CONGRESS OF MEDICAL ACUPUNCTURE AND NATURAL MEDICINE , Edmonton, Alberta, Canada, August 8-12, 1995
and made an OUTSTANDING CONTRIBUTION by presenting:

~ Pre-Congress Workshop ~

Steven KH Aung, MD

President
WNMF

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Contribution No. 0011

=> See: # 40

Phenomenon of «De Qi» or Sensory reactions during EHF-Puncture

M.Teppone, R.Avakyan, I.Karneev

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November 17-22, 2001, Bled, Slovenia, pp. 116-118
https://archive.org/details/arrival-of-qi-phenomenon-ehf

Научный Совет Российской академии наук
по проблеме "Физическая электроника"

Акционерное общество "МТА-КВЧ"

Институт радиотехники и электроники
Российской академии наук

Всероссийское научно-техническое общество
радиотехники, электроники и связи
имени А.С.Попова

Акционерное общество "НПО-Форум"

10 РОССИЙСКИЙ СИМПОЗИУМ С МЕЖДУНАРОДНЫМ УЧАСТИЕМ

МИЛЛИМЕТРОВЫЕ ВОЛНЫ В МЕДИЦИНЕ И БИОЛОГИИ

Сборник докладов

Москва, 1995

СПЕЦИФИЧЕСКИЕ ОЩУЩЕНИЯ, ВОЗНИКАЮЩИЕ ПРИ МНОГОЗОНАЛЬНОЙ КВЧ-ТЕРАПИИ

М.Теппоне, А.Кротенко

г. Москва

Несмотря на широкое внедрение КВЧ-терапии в клиническую медицину, имеется немало вопросов, встающих перед практикующим врачом. Один из них касается феномена специфических ощущений, возникающих во время КВЧ-процедуры.

В 1984-1985 гг. был разработан новый метод лечения, получивший название микроволновой резонансной терапии (МРТ). В основе метода лежала гипотеза о том, что каждый биологический объект имеет свою резонансную частоту. Подбор индивидуальной лечебной частоты (ИЛЧ) у человека осуществлялся по ощущениям, возникающим в процессе облучения одной из точек акупунктуры меняющимся по частоте низкоинтенсивным электромагнитным излучением (ЭМИ) ММ-диапазона. Специфические ощущения рассматривались как показатель резонансного отклика организма больного [1].

В процессе разработки объективных критериев подбора ИЛЧ было выявлено, что появление ощущений сопровождалось изменением температуры в области кожной проекции точек акупунктуры (ТА), причем именно тех каналов, с которыми связаны возникающие ощущения. Например, при появлении ощущения легкости и пустоты в животе, наблюдается понижение температуры точек в области живота, а ощущение тяжести или полноты сопровождается повышением температуры в тех же точках [2].

Характер специфических ощущений и динамика температуры кожи в зонах проекции ТА позволили прийти к заключению, что они соответствуют феномену "Де Чи", известному в традиционной китайской медицине (ТКМ). Согласно теории ТКМ, предусмотренные ощущения, возникающие во время процедуры иглоукалывания или прижигания, отражают изменение энергетического статуса ТА, Канала или Органа и позволяют оценивать эффективность терапии и прогнозировать результаты лечения [3].

Существует несколько типов предусмотренных ощущений.

Первый тип - ощущения, возникающие в месте воздействия, в частности в области ТА (тепло, холод, распирание, давление и др.). При этом можно выявить изменение биофизических параметров кожи в области проекции ТА [4-6].

Второй тип - ощущения, распространяющиеся вдоль канала (мурашки, покалывание, "электрический ток", тепло, холод и др.). По мере того, как движущиеся ощущения достигают очередной ТА или проекции органа, происходит изменение биофизических параметров кожи над ТА или изменение функции Органа, соответственно [4, 5].

Третий тип - ощущения, отражающие динамику "Энергетического" состояния органа или более сложных и глубоких структур. Например, тонизация "Селезенки" сопровождается появлением ощущения легкости в конечностях, животе или во всем теле. Тонизация "Легких" приводит к углублению или учащению дыхания и др.

Феномен "Де Чи" при КВЧ-пунктуре имеет ряд особенностей:

- в отличие от иглоукалывания при КВЧ-пунктуре ощущения в области воздействия достаточно редки;
- обычно вначале появляются "волны", "мурашки", "тепло" и т.п., которые распространяются вдоль конечностей или туловища;
- затем третий тип "Де Чи", соответствующий пораженному Органу;
- в отдельных случаях больные отмечают различные зрительные сенсорные реакции при закрытых глазах: происходит изменение цветового фона, яркости света; появляются цветовые пятна или более сложные зрительные образы, вплоть до простых видеосюжетов, напоминающих сновидение [6].

В ряде случаев с одной и той же ТА в зависимости от режима проведения КВЧ-процедуры, можно инициировать одновременно или последовательно несколько видов ощущений, относящихся к различным структурам.

Адекватное понимание сенсорных реакций, возникающих во время КВЧ-процедуры, позволяет использовать их в клинической практике:

1) уточнение синдромного диагноза ТКМ по характеру ощущений и траектории распространения;

2) индивидуализация режима КВЧ-терапии: при необходимости достижения тонизирующего эффекта воздействие на ТА продолжается по мере нарастания интенсивности ощущений (как правило, комфортных), а для торможения необходимо дождаться появления ощущений (возможно дискомфортных), их стабилизации и исчезновения;

3) интенсивность и характер ощущений, возникающих во время процедуры, могут служить критерием предварительной оценки эффективности лечения, а также критерием предварительной оценки эффективности работы генератора ММ ЭМИ;

4) учитывая относительную простоту достижения специфических ощущений при проведении КВЧ-пунктуры, можно использовать этот феномен для изучения механизмов, лежащих в основе лечебного эффекта, получаемого при воздействии на ТА.

В случаях отсутствия специфических ощущений, рекомендуется предварительно провести воздействие на ТА 36 Е (Цзу Сан Ли).

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THE CHINESE THEORY OF SIX CHANNELS AND POLYZONE EHF-THERAPY

M.Teppone, A.Krotenko

Moscow

According to the Chinese theory of six channels the human body has six pairs of channels or six levels, which protect it from exogenous factors of diseases. Every level has its own symptoms and recommendations for treatment.

The theory of six channels gives possibility to individualize acupoints for the polyzone EHF-therapy in treating various acute diseases.

10 Российский симпозиум с международным участием
Миллиметровые волны в медицине и биологии

КИТАЙСКАЯ ТЕОРИЯ ШЕСТИ КАНАЛОВ И МНОГОЗОНАЛЬНАЯ КВЧ-ТЕРАПИЯ

М.Теппоне, А.Кротенко

г. Москва

При проведении КВЧ-терапии ведущее значение в достижении лечебного эффекта принадлежит зоне воздействия [1]. Выбор зон воздействия, а именно точек акупунктуры (ТА), успешно решен в рамках акупунктурной теории традиционной китайской медицины (ТКМ). Сочетание биологических эффектов низкоинтенсивного электромагнитного излучения (ЭМИ) ММ-диапазона и теории ТКМ позволило разработать новый метод лечения - "Многозональная КВЧ-терапия" или "КВЧ-пунктура" [2, 3].

Все разнообразие симптомов, встречающихся у пациентов, страдающих различными заболеваниями, можно условно разделить на три группы:

1) острые неспецифические симптомы, имеющие при возникновении острых заболеваний или при обострении хронических заболеваний и отражающие развитие общего адаптационного синдрома Г.Селье;

2) специфические или "локальные" симптомы;

3) хронические неспецифические симптомы, соответствующие конституциональным особенностям человека.

Анализ различных теорий ТКМ позволяет выделить группы клинических синдромов, описывающих специфические и неспецифические симптомы острых и хронических заболеваний [4].

В данной работе основное внимание обращено на теорию шести каналов и на ее использование при лечении заболеваний, сопровождающихся острыми неспецифическими симптомами. Эффективность данной теории при лечении дуоденальных язв была продемонстрирована ранее [1].

В одном из древнейших трудов по акупунктуре "Хуан-Ди Нэй-Цзин" имеется упоминание о лихорадочных заболеваниях, которые характеризуются определенной этапностью своей эволюции. В 3 веке н.э. доктором Zhang Zhongjing был написан трактат о лихорадках, вызванных Холодом [5]. В современных работах, помимо клинического описания и фармакотерапии, приводятся рецепты по использованию различныз ТА [6-8].

Суть теории шести каналов заключается в следующем:

1) организм человека имеет 6 пар каналов или уровней, располагающихся на различной глубине и осуществляющих защиту от внешних факторов;

2) заболевание развивается снаружи внутрь, а выздоровление - изнутри наружу;

3) каждому уровню или паре каналов соответствует определенный набор неспецифических симптомов;

4) для каждого уровня имеются конкретные рекомендации по иглоукалыванию, прижиганию, фармакотерапии и диетотерапии.

Основные клинические проявления поражения уровней:

1-й - головная боль, лихорадка, зябкость, потливость, ломота в теле, непереносимость Ветра, Жары или Холода;

2-й - чередование Жара и Озноба, горечь во рту, сухость в горле, тошнота, рвота, боли в области сердца и др;

3-й - выраженная лихорадка, обильное потоотделение, жажда, непереносимость тепла, запор, боли в животе, желтоватый налет на языке и др.;

4-й - зябкость, непереносимость холода, отсутствие аппетита, тошнота, рвота, понос, белый налет на языке и др.;

5-й - а) стул с кровью, тенезмы, различные кровотечения; б) холодные конечности, боли в животе, забкость; в) чередование Жара и Озноба; г) жажда, голод, но больного рвет съеденной пищей;

6-й - а) сонливость, зябкость, рвота, понос, стул с непереваренной пищей, пульс менее 4 ударов за 1 дыхание; б) бессоница, боли в области сердца, сухость в горле, тоска, пульс более 4 ударов за 1 дыхание.

Используемые ТА (дано французское обозначение каналов):

1) 9 P, 10 P - рассеить (р), I Rp, 12 Rp - тонизировать (т);
2) 42 E (т), 58 V (р);
3) 2 Rp (т), 38 Vв (р);
4) 3 Rp (т), 40 E (р);
5) а) 3 F (р); б) 2 F (т), 3 F (т); в) P и Rp (т); г) 8 F (т), 2 F (т);
6) а) 42 E (т), 4 Rp (р); б) Rp и E (т).

Порядок использования теории шести каналов при КВЧ-терапии:

1. На основании анализа симптомов определяется "глубина" или уровень заболевания, при этом учитываются именно острые неспецифические симптомы. В сомнительных случаях или при "размазанности" по нескольким уровням, лечение начинается с наиболее "глубокого" из вероятных.

2. Осуществляется последовательное воздействие на ТА в указанном режиме. Желательно осенью и зимой использовать ТА слева, а весной и летом - справа.

3. По мере изменения клинических проявлений заболевания, а соответственно и уровня, меняются ТА.

4. При лечении первых 3-х уровней, процедуры проводятся ежедневно, на нижних уровнях - через день или через два дня.

Необходимо помнить, что после лечения заболевания на 3-м уровне (хороший аппетит, потливость, запор и др.) происходит смена симптомов и выход на 2-й уровень (тошнота, рвота, жар, озноб и др.), что может ошибочно расцениваться как обострение заболевания или эффект передозировки. На 1-м уровне могут появляться "простудные" симптомы. Исчезновение проявлений 1-го уровня отражает выздоровление при остром заболевании или купирование обострения - при хроническом заболевании.

Учитывая универсальность теории шести каналов и ее эффективность при лечении различных заболеваний, а также ограниченность ТА, подвергающихся воздействию, можно надеяться на широкое внедрение предлагаемой методики в клиническую практику.

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EHF-Puncture: A new Trend in Traditional Oriental Medicine

M.Teppone, A.Krotenko, V.Popov, I.Kostyanov

The 1st Congress of the European Association of Acupuncture
October 6-9, 1994, Chishinew, Moldova (abstracts), p. 140-141

See # 43

EHF – Puncture: Integration of East and West Modern Diagnostic & Therapeutic Microwave Equipment

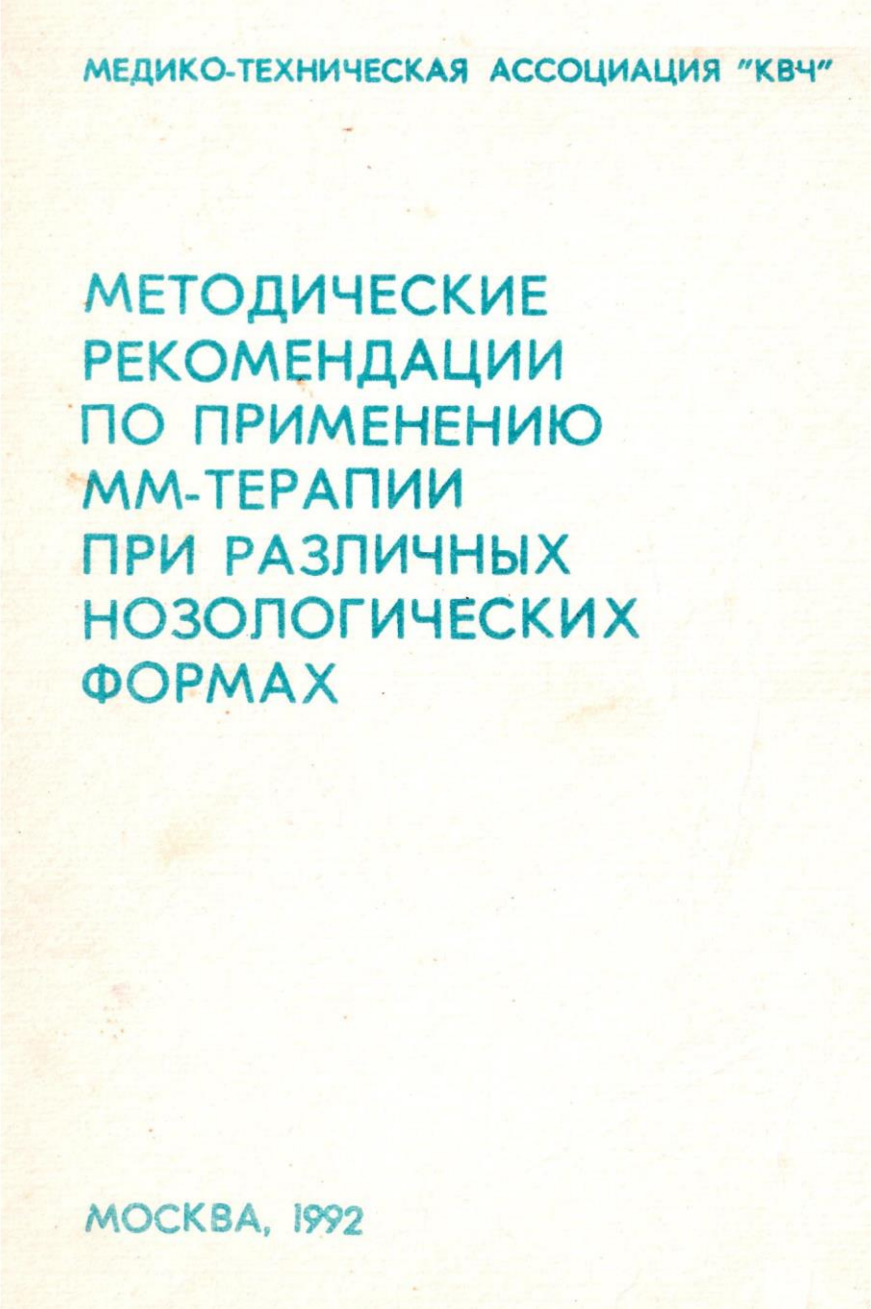
M.Teppone, R.Avakian, A.J.Scott–Morley

The 5th International Congress of Traditional Medicine & Acupuncture,
Singapore, March 18-19, 2000 pp. 81-87
https://archive.org/details/integration-ehf-tcm-singapore

Многозональная КВЧ-терапия (КВЧ-пунктура)

М. Теппоне, А. Кротенко

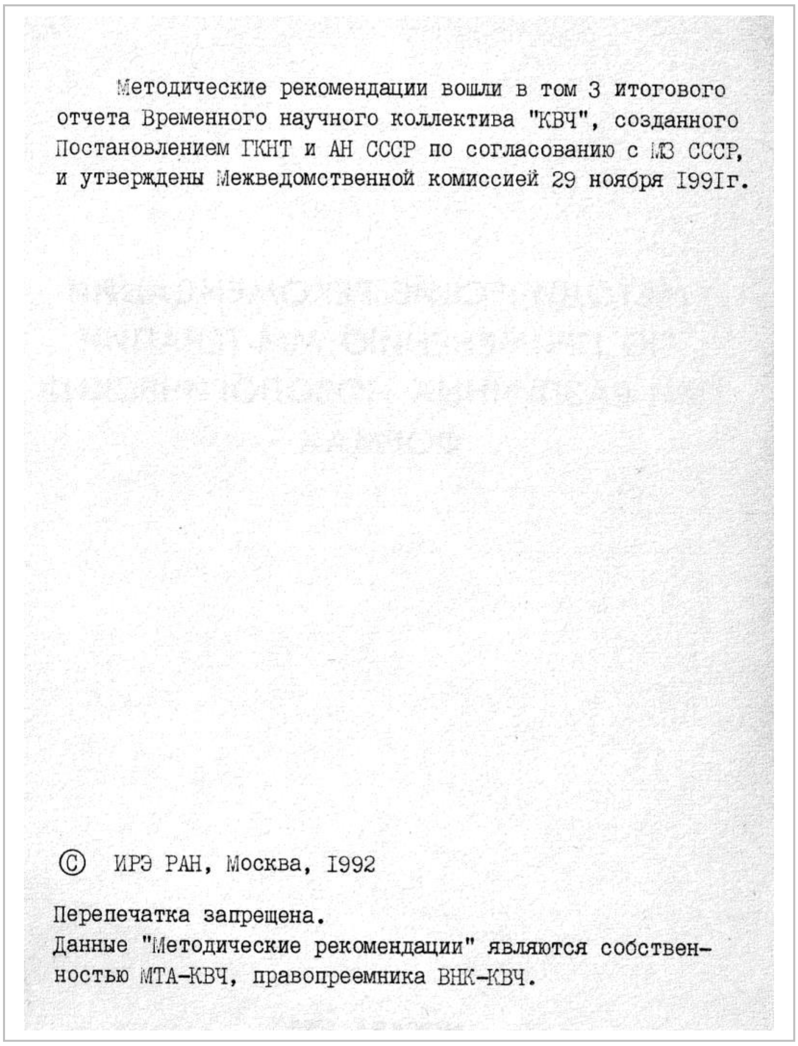
Методические рекомендации
по применению ММ-терапии при различных нозологических формах
(утверждены межведомственной комиссией ГКНТ, АН СССР и МЗ СССР 29.11.91)
Москва, 1992, с. 65-89
https://archive.org/details/1992-methods-ehf-therapy/page/n33/mode/1up



МЕДИКО-ТЕХНИЧЕСКАЯ АССОЦИАЦИЯ "КВЧ"

МЕТОДИЧЕСКИЕ
РЕКОМЕНДАЦИИ
ПО ПРИМЕНЕНИЮ
ММ-ТЕРАПИИ
ПРИ РАЗЛИЧНЫХ
НОЗОЛОГИЧЕСКИХ
ФОРМАХ

МОСКВА, 1992



Методические рекомендации вошли в том 3 итогового отчета Временного научного коллектива "КВЧ", созданного Постановлением ГКНТ и АН СССР по согласованию с МЗ СССР, и утверждены Межведомственной комиссией 29 ноября I99Iг.

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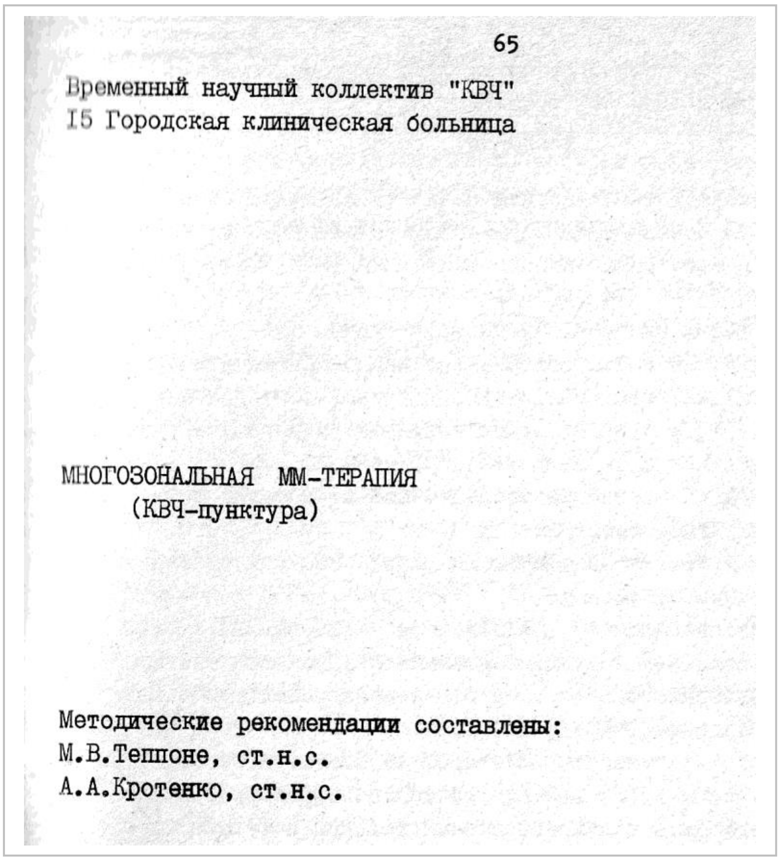

Временный научный коллектив "КВЧ"
I5 Городская клиническая больница

МНОГОЗОНАЛЬНАЯ ММ-ТЕРАПИЯ
(КВЧ-пунктура)

Методические рекомендации составлены:
М.В.Теппоне, ст.н.с.
А.А.Кротенко, ст.н.с.

КВЧ-ПУНКТУРА: КРАЙНЕ ВЫСОКОЧАСТОТНАЯ (МИЛЛИМЕТРОВАЯ) ТЕРАПИЯ И СИНДРОМЫ ТРАДИЦИОННОЙ КИТАЙСКОЙ МЕДИЦИНЫ

Крайне высокочастотная терапия является новым методом лечения, основанным на использовании различных биологических эффектов низкоинтенсивного электромагнитного излучения (ЭМИ) миллиметрового (ММ) диапазона [I-6].

Этот новый метод оказался высокоэффективным при лечении различных заболеваний: язвенная болезнь желудка и двенадцатиперстной кишки, полипы желудка, ИБС стенокардия, детский церебральный паралич и др. [I-6]. ММ-терапия применяется как самостоятельный метод лечения, так и в сочетании с лекарственной, лучевой, химио- и психотерапией, в качестве предоперационной подготовки и для лечения постоперационных состояний.

Анализ литературы, посвященной КВЧ-проблеме, позволяет выделить несколько типов эффектов:

I. Специфические эффекты, связанные с частотой ЭМИ.

2. Неспецифические эффекты, связанные с зоной воздействия.

3. Неспецифические эффекты, обусловленные развитием общего адаптационного синдрома (ОАС) [I-5].

Имеется несколько методик ММ-терапии, что отражает различные взгляды на механизмы реализации лечебного эффекта. Согласно одной из них необходимо подбирать индивидуальную лечебную частоту (ИЛЧ) для каждого пациента [8]. В других случаях индивидуализируют зоны воздействия [9, I0]. Иногда индивидуализируют зоны воздействия и частоту ЭМИ [II]. Обычно ИЛЧ подбирается на основании сенсорных реакций, возникающих у пациентов во время смены частот ЭМИ. Считают, что ИЛЧ вызывает появление наиболее комфортных ощущений, причем не в зоне воздействия, а в области условной проекции больного органа [8]. Сенсорные реакции сопровождаются изменением функции различных органов и систем, что может быть зафиксировано с помощью электрокардиографа [8], электроэнцефалографа [I2], электрогастрографа [I3], тепловизора и т.д. [8]. Предложены различные методы приборного поиска индивидуальной лечебной частоты [I2, I4-I6].

Имеется несколько типов аппаратов, позволяющих осуществлять ММ-терапию: медицинский генератор "Электроника-КВЧ" может применяться для локального воздействия, т.е. для КВЧ-пунктуры; медицинский генератор "Явь-I" с различными фиксированными длинами волн (5,6 и 7,I мм) применяется для воздействия на различные зоны кожной поверхности; технический генератор Г4-I42, позволяющий посредством диэлектрического волновода осуществлять локальное воздействие в режимах применения фиксированной и индивидуально выбранной частот (рис.8) [7].

Проведена ММ-терапия с индивидуальным подбором частоты для 5I амбулаторного больного с обострением язвенной болезни двенадцатиперстной кишки. ИЛЧ выбиралась на основании сенсорных реакций, возникавших у пациентов во время смены частот ЭМИ в диапазоне 53,5-70,0 ГГц. Воздействие осуществлялось на точки акупунктуры (ТА) 36Е (Цзу Сан Ли), 40Е (Фэн Лун), 6МС (Ней Гуань) и другие. При этом ТА использовались без специального индивидуального подбора. Контрольные эндоскопические исследования показали следующие результаты лечения: через 2 недели ММ-терапии полное заживление язвенного дефекта наступило у 3I,4±6,6% больных, а через 3 недели - у 35,3±6,8%. Положительный эффект, т.е. заживление язвенного дефекта и уменьшение линейных размеров язвы в 2 и более раз, достигнут в 58,8±7,0% случаев. При этом, если воздействию подвергалась ТА 36Е (Цзу Сан Ли), положительный эффект получен у 7I,0±8,3% больных. При воздействии на другие ТА - только в 40,0±II,2% случаев (рис.9). Различия достоверны ($p < 0,05$) [I0]. Был сделан вывод, что ведущее значение в ММ-терапии имеет зона воздействия, а не частота ЭМИ.

Проводилось измерение температуры в областях кожной проекции ТА во время смены частот ЭМИ. Было выявлено, что при появлении ощущений "тяжесть, полнота в животе" наблюдается повышение температуры в области ТА I2IМ (Чжун Вань), 25Е (Тянь Шу) и др. Ощущения "легкость, пустота в области живота" сопровождались снижением температуры в указанных ТА. Во время головокружения можно было наблюдать снижение температуры в области дистальных ТА канала Печени и т.д. Изменения температуры достигали 0,I-0,5°С и более. Это позволило предположить, что возникающие ощущения отражают феномен De-Qi, известный в традиционной китайской медицине (ТКМ).

К настоящему времени имеется достаточно теоретического, экспериментального и клинического материала, позволяющего предпола-

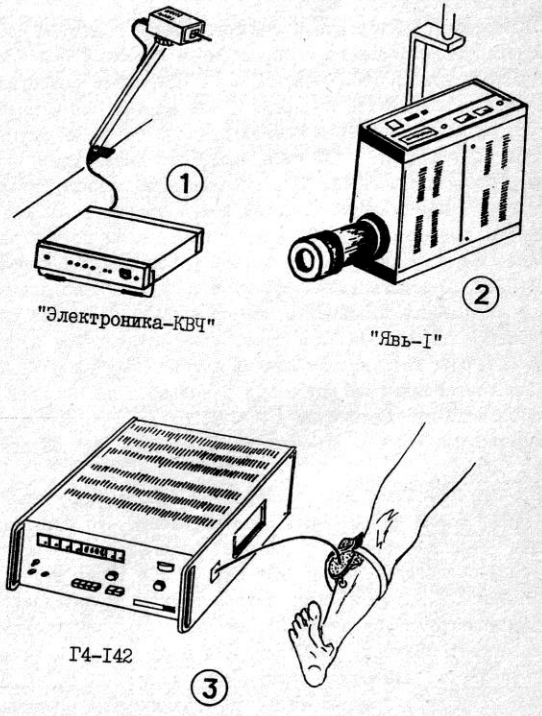
①
②
③
"Электроника-КВЧ"
"Явь-I"
Г4-I42

Рис.8

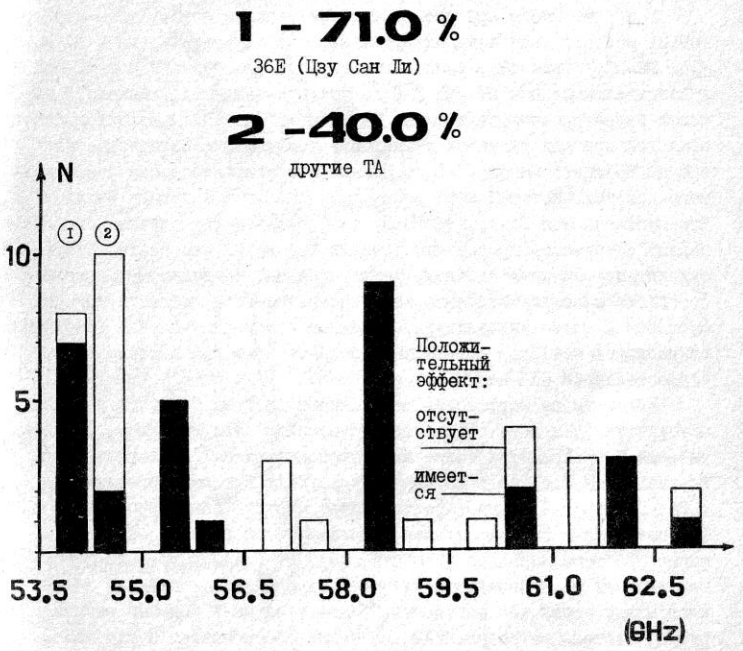
1 - 71.0 %
36E (Цзу Сан Ли)
2 -40.0 %
другие ТА
N
① ②
10
5
Положительный эффект:
отсутствует
имеется
53.5
55.0
56.5
58.0
59.5
61.0
62.5
(GHz)

Рис.9

гать, что во время ММ-терапии ведущую роль в повышении эффективности лечения играет не частота ЭМИ, а зона воздействия [10, 17-18]. Частота ЭМИ определяет особенности поглощения ММ-диапазона водосодержащими структурами кожи [19-20], т.е. коэффициенты поглощения и отражения, а следовательно, и интенсивность раздражения облучаемой зоны. Конечный неспецифический эффект КВЧ-воздействия реализуется при участии различных систем макроорганизма и существенно не отличается от эффекта, возникающего при воздействии других факторов электромагнитной и неэлектромагнитной природы [21].

Наиболее часто при проведении ММ-терапии воздействию подвергаются области кожи крупных суставов, зон Захарьина-Геда и ТА [8, 22-23] (рис.10). Было выявлено, что ТА обладают повышенной чувствительностью к ММ ЭМИ [8], что, по-видимому, связано с высокой гидратированностью ткани ТА [24]. Высокая чувствительность областей крупных суставов к внешнему воздействию была известна врачам Древнего Китая [25]. Однако это лишь небольшая часть кожного покрова, который может быть использован в лечебных целях. Что касается зон Захарьина-Геда, то в большинстве случаев они совпадают с трансформированными точками "тревоги" или соответствуют сухожильно-мышечным каналам. Таким образом, по-видимому, нецелесообразно выделять отдельно зоны Захарьина-Геда, области крупных суставов и точек акупунктуры. В каждом конкретном случае требуется выбирать наиболее оптимальные области кожи, на которые будет осуществляться КВЧ-воздействие.

Не обсуждая морфологические основы системы "каналов и точек акупунктуры", нельзя согласиться с мнением, что канально-точечная система "... является более высокоорганизованной и сложной, чем нервная, эндокринная и другие регулирующие системы организма" [26]. Напротив, можно предположить, что это самая простая (морфологическая и функциональная простота обусловливает верификационные проблемы канально-точечной системы) и самая древняя (филогенетически и онтогенетически) система организма, которая объединяет между собой все остальные, более сложные и молодые регулирующие системы макроорганизма, а также обеспечивает взаимодействие внутренней среды организма с внешним окружением.

Исследования последних лет значительно расширили научное понимание механизмов реализации лечебного воздействия на кожные по-

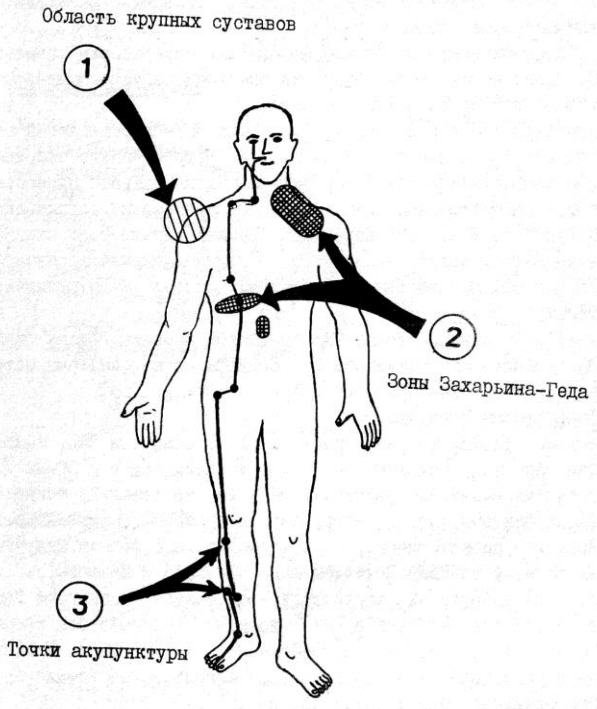

Рис.10

кровы [27-29]. Но, к сожалению, это не привело к созданию современных рекомендаций по выбору ТА. До настоящего времени акупунктурная теория ТКМ остается наиболее продуктивной для индивидуализации ТА в процессе лечения.

Синдромы традиционной китайской медицины. Большинство пациентов независимо от заболевания имеют различные типы симптомов:

I. Острые неспецифические симптомы, отражающие развитие общего адаптационного синдрома Селье.

2. Специфические симптомы, отражающие особенности заболевания.

3. Хронические неспецифические симптомы, обусловленные конституционными особенностями больного.

Преобладание тех или иных групп симптомов определяется степенью остроты болезненного процесса. Чем острее начало заболевания, тем больше симптомов ОАС. После стихания остроты процесса выявляются специфические симптомы, обусловленные нозологической формой или "локализацией" поражения. Затем ведущую роль начинают играть конституциональные симптомы. В случае лечения хронического заболевания обычно наблюдается обратный порядок смены клинических проявлений.

Анализ различных теорий ТКМ позволяет выбрать группы синдромов, описывающих специфические и неспецифические симптомы острых и хронических заболеваний (рис.II).

I. Синдромы I группы.

Острые неспецифические симптомы, т.е. симптомы ОАС, наиболее подробно описаны китайским врачом Zhang Zhongjing в [30-32]. Эта теория включает "...различные аспекты заболеваний, такие как патогенные факторы Холод, Ветер, Жара и Тепло; болезнь Внутреннего и Внешнего происхождения; трансформация заболевания Снаружи Внутрь; болезни по типу Холода и Жары, Полноты и Пустоты..." [30]. Если заболевание характеризуется только признаками Жары (жажда, кровотечения, сыпь и др.), то можно использовать теорию 4-х слоев: Wei, Qi, Ying, Xue доктора Je Gui [33-35]. Если же болезнь обусловлена Жарой-Сыростью, то используется теория Тройного Обогревателя (San Jiao) [25, 33-35].

Во время проведения ММ-терапии теория "Шести Каналов" обычно используется при лечении обострения язвенной болезни желудка и двенадцатиперстной кишки, начальных этапов различных простудных заболеваний, абстинентных синдромов и др., т.е. любых заболеваний

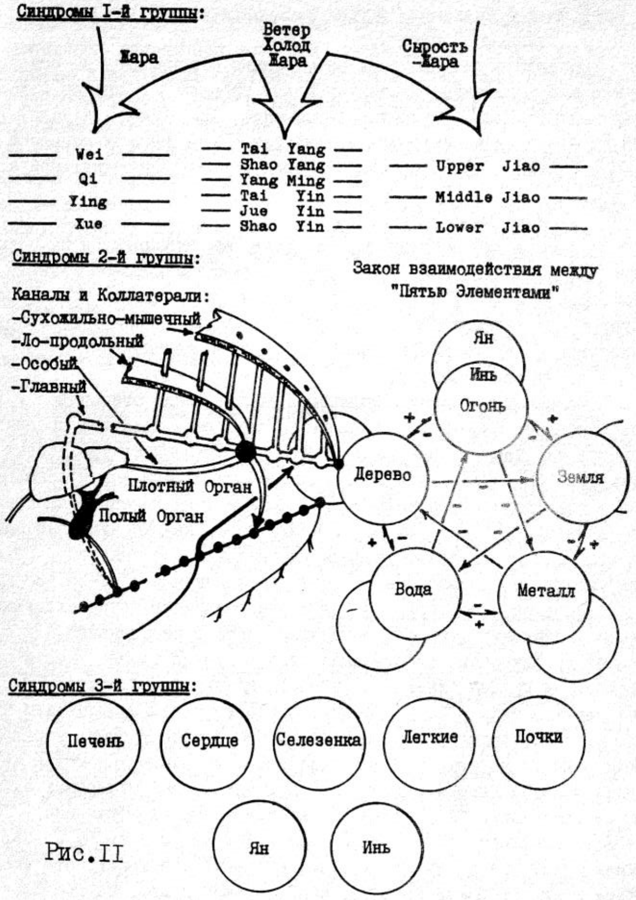
Синдромы I-й группы:
Жара
Ветер
Холод
Жара
Сырость
-Жара
Wei
Qi
Ying
Xue
Tai Yang
Shao Yang
Yang Ming
Tai Yin
Jue Yin
Shao Yin
Upper Jiao
Middle Jiao
Lower Jiao
Синдромы 2-й группы:
Каналы и Коллатерали:
-Сухожильно-мышечный
-Ло-продольный
-Особый
-Главный
Плотный Орган
Полый Орган
Закон взаимодействия между
"Пятью Элементами"
Ян
Инь
Огонь
Дерево
Земля
Вода
Металл
+
-
Синдромы 3-й группы:
Печень
Сердце
Селезенка
Легкие
Почки
Ян
Инь

Рис.II

и состояний с наличием "острых неспецифических" симптомов.

2. Синдромы 2 группы.

Специфические симптомы заболевания описываются на основании синдромов поражения "Плотных и Полых Органов", "Каналов и Коллатералей" (главные, сухожильно-мышечные, Ло-, особые каналы) [33-35]. Эта группа синдромов используется при лечении язвенной болезни, полипов желудка, кисты печени и почек, бронхиальной астмы и др.

3. Синдромы 3 группы.

Хронические неспецифические симптомы описываются на основании "Пяти конституций" [25, 36], а также синдромов Пустоты Ян, Инь, Крови и **Qi** [33-35]. Третья группа синдромов обычно используется при лечении ИБС стенокардии, бронхиальной астмы, запоров, энурезов и других хронических состояний и заболеваний.

4. Чудесные каналы.

Симптомы поражения Чудесных каналов могут относиться к любой из описанных выше групп синдромов. Например, **Yang Wei** соединяет уровни **Tai Yang** и **Shao Yang**, а **Yin Wei** объединяет три уровня Инь: **Tai Yin**, **Shao Yin** и **Jue Yin**. Таким образом, они могут использоваться в сочетании с теорией "Шести каналов" при лечении экзогенных заболеваний [33-34, 37-38]. Кроме того, каждый Чудесный канал имеет свои определенные конституциональные особенности [39] и нарушения, обусловленные Внутренними причинами [33-35, 38].

Порядок использования синдромов различных групп следующий: если у пациента имеются проявления острого заболевания или обострения хронического заболевания, используется теория "Шести каналов" (I-я группа синдромов) и рекомендации **Chamfrault A.** [33] и **Nguyen Van Nghi** [34]. Лечение проводится каждый день или через день, очень редко - 2 раза в день. Чем глубже уровень поражения, тем реже процедуры, чем поверхностнее, тем чаще. Несмотря на различные нозологические диагнозы, при одинаковых синдромах выбираются одинаковые ТА. Например, **Tai Yin - 3Rp** (возбуждение - "в") и 40E (торможение - "т"), **Yang Ming - 2Rp** (в) и **38VB** (т), **Shao Yang - 42E** (в) и **58V** (т) и т.д. Не следует забывать, что синдром **Yang Ming** (хороший аппетит, запор, жажда и др.) на фоне лечения трансформируется в синдром **Shao Yang**(отсутствие аппетита, тошнота, чередование жара и озноба и др.), что пациент может расценивать как ухудшение. Но адекватная терапия приводит к смене клинических проявлений, соответствующих синдрому **Shao Yang**, на синдром **Tai Yang** (зябкость, напряжение мышц шеи, заложенность носа и др.). Исчезновение клинических проявлений синдрома **Tai Yang** свидетельствует об излечивании острого заболевания или купировании обострения хронического заболевания.

Проведено амбулаторное лечение 44 больных с обострением язвенной болезни двенадцатиперстной кишки. ТА выбирались на основании теории "Шести каналов". Наиболее часто встречались синдромы **Yang Ming** (29,6±7,0%) и **Jue Yin** (45,4±7,6%). Результаты лечения были следующими: через 2 недели лечения заживление язвенного дефекта наступило в 65,9±7,2% случаев: у больных с синдромом **Yang Ming** заживление язвы наблюдалось в 92,3±7,7%, а **Jue Yin** - в 60,0±II,3% случаев. Различия достоверны ($p >$ 0,05). Через 3 недели лечения заживление язвенного дефекта наблюдалось у 75,0±6,6% больных [I0] (рис. I2).

Приводим два клинических примера больных с синдромом **Yang Ming**. (I) Больная Т., женщина 48 лет, перед лечением выявлено два язвенных дефекта слизистой оболочки луковицы двенадцатиперстной кишки: 20 и 6 мм. Через 2 недели лечения наблюдалось заживление язв. (2) Больной Д., 35-летний мужчина, жаловался на боли и ощущение жжения в эпигастральной области, с ухудшением при надавливании на живот, раздражительность, жажду, запор. Выявлен язвенный дефект слизистой оболочки луковицы двенадцатиперстной кишки размером 7х4 мм. Потребовалось всего 2 процедуры ММ-терапии, после чего клинические проявления заболевания были купированы. Через 2 недели от первой лечебной процедуры язвенный дефект выявлен не был.

При наличии специфических симптомов заболевания используются синдромы 2-й группы. Лечение проводится 2-3 раза в неделю и реже.

Проведена ММ-терапия I3 человек с полипами желудка. Основные клинические проявления заболевания соответствовали синдромам "Пустота или Полнота Ло-продольного канала Селезенки" или "Жара-Сырость в Желудке и Селезенке". Для лечения синдрома "Пустоты Ло-продольного канала Селезенки" используются ТА **3Rp** (в) и **40E** (т). Для лечения синдрома "Полноты Ло-продольного канала Селезенки" используется ТА **4Rp**. Для рассеивания "Жары-Сырости" - ТА **44E**, 36E, 3Rp (т).

После 4-х месяцев лечения у большинства пациентов отмечалось исчезновение или уменьшение выраженности имевшихся жалоб. Полное

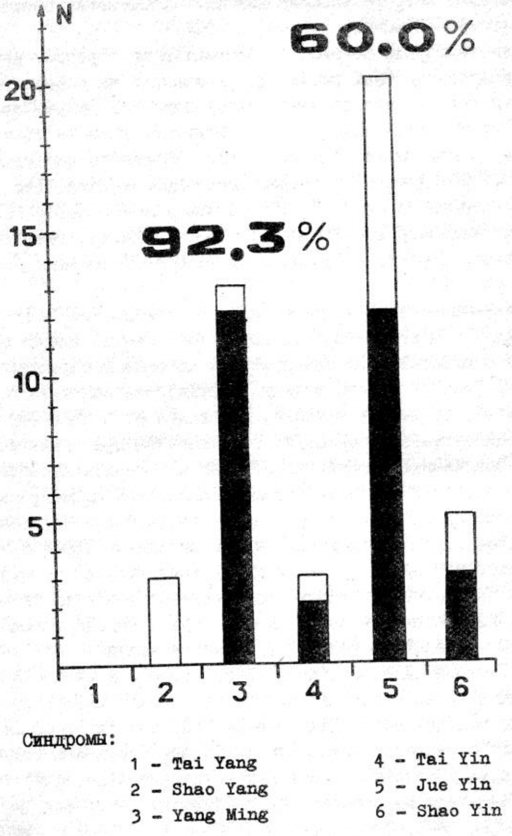

Рис.I2

исчезновение одного и более полипов произошло у 5 человек (38,4%), уменьшение линейных размеров полипов в 2 и более раз - у 4 (30,8%), уменьшение на I/3 - у 3 (23,I%) больных. Только в одном случае положительная динамика со стороны клинических и эндоскопических проявлений заболевания отсутствовала.

Клинический пример: у б-го К., 54 лет, перед началом лечения выявлено 3 полипа желудка: I2, I4 и I2 мм в диаметре. Через 4 месяца лечения обнаружен один полип размером 6 мм [41, 40].

При наличии хронических неспецифических симптомов использовались синдромы "Пустоты Плотных Органов", а также "Пустоты Инь и Ян", т.е. 3-я группа синдромов. Обычно воздействие осуществлялось на основании принципов "Шу-Мо-терапии". ("Мо" - точки "тревоги", располагающиеся на передней поверхности грудной клетки и брюшной стенки. "Шу" - "сочувственные точки", располагающиеся на спине вдоль канала Мочевого пузыря). Процедуры проводятся I раз в неделю и реже. При наличии синдромов "Пустоты" нескольких "Плотных Органов", учитывается их взаимодействие на основании закона "Пяти элементов". Например, при наличии "Пустоты Селезенки и Почек" - тормозится Печень, при "Пустоте Селезенки и Легких" - тонизируется Селезенка, при "Пустоте Селезенки, Почек, Печени" - тонизируется Ло-точка трех Инь каналов ног (6Rp) и т.д. При наличии синдрома "Пустоты Ян" используются ТА: 4JM, 4TM, 36E. При синдроме "Пустоты Инь" - 23V, 4JM, 6Rp (в).

Проведено лечение I5 больных с ИБС стенокардией. Обычно имелись признаки "Пустоты Легких, Почек, Инь" и "Полноты Ян Печени". Для контроля за эффективностью лечения использовалась велоэргометрическая (ВЭМ) проба. После 4-6 месяцев ММ-терапии результаты лечения были следующими: "значительное улучшение" (уменьшение приступов стенокардии, снижение дозы антиангинальных препаратов и повышение толерантности к физической нагрузке на ступень и более - по ВЭМ) достигнуто в 26,6% случаев. "Улучшение" (клиническое улучшение без динамики ВЭМ) - в 40,0%. "Без эффекта" (отсутствие положительной клинической и ВЭМ динамики в течение 2 месяцев лечения) - в 33,4% случаев [42].

Больной Д., мужчина 43 лет, с диагнозом ИБС стенокардия напряжения, Ш функциональный класс (по Канадской классификации, I979). Начальная доза лекарственных препаратов - анаприлин и нитросорбид по I60 мг/сут. Такие конституциональные нарушения, как заикание, облысение указывают на "Пустоту Легких". До начала лечения (июнь, I990 г.) толерантность к физической нагрузке по ВЭМ не превышала 75 Вт, при частоте сердечных сокращений - 85 в I мин. Использовались "Шу-Мо" точки канала Легких: 1P (т), 13V (в). Процедуры проводились I раз в неделю. С января I99I г. антиангинальные препараты не принимает. ВЭМ (май, I99I г.) - I50 Вт при частоте сердечных сокращений I20 в I мин.

Иногда имеется возможность одновременного использования синдромов различных групп, например, одновременное наличие родственных синдромов **Yang Ming**, Пустота Инь Желудка и Пустота Инь предполагает воздействие на ТА: 2Rp (в), 38VB (т), 6RP (в), 44E (т) и т.д.

Следует учитывать рекомендации ТКМ по выбору стороны воздействия. Так, в летнее и весеннее время необходимо преимущественно воздействовать на ТА правой стороны, а осенью и зимой - левой стороны.

ЭМИ ММ-диапазона может использоваться при лечении болезней по типу "Полноты и Пустоты", "Жары и Холода". Модальность эффекта будет определяться длительностью облучения точек. Для достижения возбуждающего эффекта (в) длительность облучения не более 2-5 мин. При этом необходимо дождаться появления первых специфических ощущений. Для тормозного (т) эффекта длительность воздействия 20-25 мин. Требуется дождаться появления специфических ощущений, нарастания их интенсивности, а затем стихания. Для "согревания" воздействие не превышает 0,5-2 мин. Некоторые пациенты отмечают появление ощущения тепла в области воздействия или в других частях тела. При этом можно наблюдать учащение пульса с 2-3 ударов за одно дыхание (синдром Холода) до 5 (нормальный пульс). Для "охлаждения" длительность воздействия может достигать 30 мин и более. Отмечается ощущение остывания лица, живота и т.д. Пульс урежается с 6-8 (синдром Жары) до 5 ударов за одно дыхание.

Если, несмотря на правильность синдромного диагноза и адекватность выбранных ТА, у больного отсутствуют специфические ощущения, можно предварительно осуществлять воздействие на ТА 36E, предполагая наличие синдрома "отека Органов или каналов" [25].

Специфические ощущения, возникающие при ММ-терапии

ММ-терапия или КВЧ-пунктура обладают такой особенностью, которая позволяет считать новый метод лечения более эффективным, чем традиционное иглоукалывание. Это можно продемонстрировать на примере специфических ощущений, возникающих во время лечебных процедур. Согласно теории ТКМ, эффект лечения можно оценить на основании специфических ощущений (феномен "De Qi"), которые возникают у пациента во время иглотерапии, **Qi Gong** и других лечебных методов ТКМ. Существует несколько типов De Qi: первый тип - это ощущения, возникающие в области ТА. Второй тип - ощущения, распространяющиеся вдоль канала [43]. Третий тип De Qi относится к целым каналам или Органам [40].

Во время проведения КВЧ-пунктуры наиболее часто встречаются 2-й и 3-й типы сенсорных реакций. В начале процедуры появляются "волны", "мурашки", распространяющиеся вдоль конечностей и туловища. Затем пациенты имеют различные ощущения, отражающие устранение исходно имевшихся нарушений. Например, при синдроме "Пустоты Селезенки", для которого характерно помимо прочих симптомов наличие "тяжести в теле", после I-2-минутного воздействия на ТА 2Rp наблюдается появление ощущения "легкость в животе или во всем теле", "покачивание" и даже "парение над кушеткой". Воздействие на ТА 36E или 44E в течение 20-30 мин при наличии синдрома "Полнота Жары в Желудке" (жажда, сухость во рту, повышенный аппетит, запоры и др.) сопровождается исчезновением сухости во рту, нарастанием выделения слюны, ощущением остывания живота и т.д. Для больных с полипами желудка наиболее характерными ощущениями были "движение в животе мелких пузырьков воздуха", что указывает на нарушения в Среднем Обогревателе (Желудок-Селезенка) [25].

У некоторых пациентов наблюдаются различные "визуальные сенсорные реакции" (глаза при этом закрыты), т.е. "изменение цветов", "появление света" или даже более сложные зрительные образы. Иногда больные "видят", как "различные цвета выходят из тела в области глаз, точки между бровей, а также - конечностей". В начале лечения больные ИБС стенокардией "видели выход черного, серого, фиолетового цветов". Позднее "появляются зеленый, желтый, оранжевый цвета или их комбинация". Через несколько недель "поля зрения заполняются голубым, розовым и солнечными цветами приятных оттенков".

Как правило, эффект лечения зависит от типа и интенсивности сенсорных реакций. Крайне редко пациенты наблюдают улучшение состояния, несмотря на отсутствие специфических ощущений. Обычно эффект лечения ниже у больных с оперативными вмешательствами в анамнезе. Возможно, это обусловлено тем, что у них клинические проявления заболевания отражают внутренние нарушения неадекватно. При одновременном использовании КВЧ-пунктуры и современных препаратов, может наблюдаться эффект их передозировки. Ожидается улучшение результатов лечения при сочетании КВЧ-пунктуры с другими средствами и методами ТКМ (диета, лекарственные препараты, иглоукалывание и прижигание, **Qi Gong**).

Предлагаемая методика ММ-терапии универсальна и ее можно использовать при лечении широкого круга заболеваний, в частности, язвенной болезни [10], полипов желудка [40, 41], ИБС стенокардии [42], кисты печени и почек, панических атак, полипов носа и бронхиальной астмы, энуреза, различных болевых и абстинентных синдромов и т.д. По-видимому, возможность постановки синдромного диагноза ТКМ является показанием к назначению многозональной ММ-терапии.

Противопоказания те же, что и для иглотерапии.

Во время использования КВЧ-пунктуры каких-либо осложнений, характерных для применения ММ ЭМИ, выявлено не было. Тем не менее при неправильном диагнозе (синдром ТКМ) и неадекватном режиме лечения (тонизация при синдроме "Полноты" или торможение при синдроме "Пустоты") возможно обострение заболевания, усиление интенсивности имевшихся жалоб и даже появление новых.

Таким образом, ММ-терапия с индивидуальным подбором зон воздействия на основании синдромного подхода традиционной китайской медицины является новым эффективным методом лечения различных заболеваний, в том числе и тех, для которых не решены вопросы этиологии и патогенеза, где имеется затруднение с постановкой нозологического диагноза, не разработаны современные методы обследования и лечения.

Неспецифические симптомы, отражающие развитие ОАС или описание синдромов теории "Шести каналов" доктора **Zhang Zhongjing** и рекомендации по их лечению

I. **Tai Yang:** - Затылочные головные боли,
- Напряжение мышц шеи и спины,
- Повышение температуры, "лихорадка",
- Зябкость.

2. **Shao Yang:** - Чередование Жара и Озноба,
- Потеря аппетита, тошнота, рвота, горечь во рту,
- Ощущение полноты в боковых отделах живота и груди,
- Односторонняя головная боль, головокружение,
- Боль в области сердца и в животе,
- Возможен жидкий стул,
- Астматическое дыхание.

3. **Yang Ming:** - Хороший аппетит,
- Сухость во рту, жажда,
- Потливость,
- Плохая переносимость жары,
- Запоры, вздутие живота,
- Язык покрыт желтоватым налетом.

4. **Tai Yin:** - Отсутствие аппетита, жажда,
- Тошнота, рвота белой слизью,
- Боли в животе,
- Тяжесть в теле,
- Жидкий стул, возможно вздутие живота,
- Боли в суставах,
- Плохая переносимость холода,
- Язык с белым налетом,
- Пульс менее 4 ударов за одно дыхание.

5. **Jue Yin:** а) "Попеременная победа Жары и Холода"
- Чередование Жара и Озноба,
- Голод, но после приема пищи возникает рвота,
- Боли в области сердца,

- Боли и напряжение мышц живота,
- Холодные конечности.

б) "Жара Печени"
- Тенезмы, понос, стул с кровью, "мелена",
- Рвота с кровью,
- Горечь во рту,
- Сухость во рту, возможно без жажды,
- Боли в подреберье и боковых частях туловища,
- Боли и полнота в боковых отделах грудной клетки,
- Боли в ребрах.

в) "Холод Печени"
- Рвота кислым и горьким содержимым,
- Отсутствие аппетита,
- Конечности мерзнут и немеют,
- Боли в животе и напряжение мышц брюшной стенки,
- Стул с непереваренной пищей.

6. **Shao Yin:** а) "Пустота Холода"
- Сонливость,
- Плохая переносимость холода,
- Холодные конечности,
- Жидкий стул с непереваренной пищей,
- Язык покрыт белым налетом,
- Пульс менее 4 ударов за одно дыхание (холод).

б) "Пустота Жары"
- Раздражительность, бессонница,
- Сухость кожи и горла,
- Ощущение тепла в области сердца и конечностей,
- Боли в сердце,
- Возможен жидкий стул,
- Красный язык,
- Пульс более 6 ударов за одно дыхание (жара).

Лечение синдромов теории "Шести каналов":
- **Tai Yang:** 10P, 9P (т) + 1RP, 2RP (в),
- Shao Yang: 42E (в) + 58V (т),
- **Yang Ming:** 2RP (в) + 38VB (т),
- **Tai Yin:** 3Rp (в) + 40E (т),
- Jue Yin: а) 9P, 2Rp, 3Rp (в),

б) 3F (т),
в) 8F, 3F, 2Rp (в),
- **Shao Yin:** а) 42E (в), 4Rp (т),
б) 2Rp, 41E, 36E (в).

Хронические неспецифические или конституциональные синдромы

I. "Пустота Печени"	- Ломкость ногтей, онемение конечностей, - Снижение остроты зрения, - Сонливость, головная боль, головокружение.
2. "Пустота Сердца"	- Бессонница, кошмары во сне, - Беспокойство, снижение памяти, - Сердцебиение.
3. "Пустота Селезенки"	- Вязкий, жидкий стул, - Снижение веса и аппетита, - Полнота и урчание в животе.
4. "Пустота Легких"	- Выпадение волос, зябкость, - Одышка, кашель, - Слабый голос, заикание.
5. "Пустота Почек"	- Слабые, больные зубы, - Отеки, шум и звон в ушах, - Боли в спине и пятках, слабость спины.
6. "Пустота Ян"	- Бледность кожных покровов, темное лицо, - Непереносимость холода, зябкость, - Импотенция, снижение либидо, - Частое мочеиспускание, бесцветная моча, - Язык бледный, отекший, - Жидкий стул, отсутствие жажды и аппетита, - Пульс менее 4 ударов за одно дыхание.
7. "Пустота Инь"	- Гиперемия скул,приливы жара к лицу, - Ощущение тепла в ладонях, стопах, сердце, - Редкое мочеиспускание, темная моча, - Ночная потливость, (никтурия), - Язык красный, - Тенденция к запорам, - Пульс более 5 ударов за одно дыхание.

Лечение конституциональных синдромов,
I. Пустота Печени 18V, 8F, 3F (в),
2. Пустота Сердца 15V, 9C (в),

3. Пустота Селезенки 20V, 2Rp, 3Rp(в),
4. Пустота Легких I3V, 9P (в),
5. Пустота Почек 23V, 7R, 3R (в),
6. Пустота Ян 4Jm, 4TM, 36E (в),
7. Пустота Инь 23V, 4Jm, 6Rp (в).

Специфические или "локальные" синдромы, характерные для обострения язвенной болезни и гастрита (по [44])

"Печень поражает Желудок"
- Полнота и напряжение в эпигастральной области,
- Иррадиация болей в подреберье,
- Частая отрыжка, тошнота, рвота, горечь во рту,
- Раздражительность, ухудшение после "стресса",
- Изжога,
- Запор (Желудок) или Понос (Селезенка).

"Пустота-Холод Желудка и Селезенки"
- Тупая, ноющая боль в эпигастрии,
- Ухудшение натощак, улучшение после еды, тепла,
- Слабость, недомогание, утомляемость,
- Жидкий стул,
- Тошнота, отсутствие аппетита, рвота слизью,
- Язык покрыт белым налетом,
- Пульс менее 5 ударов за одно дыхание (холод).

"Пустота Инь Желудка"
- Тупая ноющая боль в эпигастрии, жжение,
- Голод без аппетита,
- Сухость в горле и во рту,
- Запоры, потливость ночью,
- Другие признаки синдрома "Пустота Инь".

"Сырость-Жара Желудка и Селезенки"
- Распирающая, давящая боль в эпигастрии,
- Ухудшение после приема пищи,
- Горечь, неприятный вкус во рту, запах изо рта,
- Ощущение полноты в груди, слабость,
- Снижение аппетита, равнодушие к еде, тошнота,
- Улучшение после рвоты и отрыжки.

Лечение специфических синдромов:

I. Печень поражает Желудок I4F, 2F, 3F (т),

2. Пустота-Холод Желудка и Селезенки 36E, 2Rp, I2Jm(в),
3. Пустота Инь Желудка 6Rp, 23V, 7R (в), 36E, 44E
4. Сырость-Жара Желудка и Селезенки 36E, 44E, 3Rp (т).

Точки "тревоги" (Мо) и "сочувственные" (Шу) точки

Название канала	Обозначение (Фр)	Мо	Шу
I. Легкие	P	1P	13V
2. Толстый кишечник	Gi	25E	25V
3. Желудок	E	12JM	21V
4. Селезенка	Rp	13F	20V
5. Сердце	C	14Jm	15V
6. Тонкий кишечник	Ig	4Jm	27V
7. Мочевой пузырь	V	3Jm	28V
8. Почки	R	25VB	23V
9. Перикард	MC	1MC	14V
IO. Тройной обогреватель	Tr	5Jm	22V
– Верхний (Сердце-Легкие)		17Jm	
– Средний (Селезенка-Желудок)		12Jm	
– Нижний (Печень-Почки)		7Jm	
II. Желчный пузырь	VB	24VB	19V
I2. Печень	F	14F	18V
I3. Задний срединный канал	TM		
I4. Передний срединный канал	JM		

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Abstract Book

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3. The wide band of frequencies applied.
4. The low supplied power.
5. Small size.
6. The ease of operation.

P-46

LASER THERAPY IN TREATMENT OF DUODENAL ULCER DISEASE

Yu A. Kopyov and V.V. Poushkarev. Department of Hospital Surgery, St. Bogomolet's Medical Institute in Kiev, Ukraine.

The aim of presenting study was to indicate the effect of He-Ne laser using on duodenal ulcer deffect.

Laser treatment began from endoscopic diagnostic of duodenal ulcer. We used He-Ne laser LG 75 with wave 0,63 mkm and mono-quartz light guide. It lead in duodenum through endoscopic biopsy canal.

The density of power was from 1,5 till 5 mVt/sm^2. Duration of treatment were from 3 till 5 minutes. Patients were undergo 4-5 procedures.

48 patients with duodenal ulcer disease were examined. This group of patients ranging in age from 19 till 51 years. The control group consist of 46 patients from 20 till 60 years old. They undergo traditional drug therapy.

As a result, in group of patients, whose undergo laser therapy, clinical effect was indicated. This effect characterized with quick cupping of pain, cut down the time of gastroduodenal mucosa regeneration. The regeneration of duodenal wall elapse without cicatricial deformation.

P-47

THERAPEUTIC APPLICATION OF LOW INTENSIVE MICROWAVES IN COMBINATION WITH ACUPUNCTURE THEORY OF TRADITIONAL CHINESE MEDICINE

M. Teppone[1], A. Krotenko and V. Popov[2]. [1]Tomilino, Moscow Region 140070, USSR. [2]Government Science Industrial Firm (GSIF), 21 Moscow 103001, Russia.

Low intensive electromagnetic radiation (EMR) of MM band is absorbed by hydrated structures of bioobjects (Ilyina S. et al 1979). IMA NKR influence is accompanied by bioeffects, which depend on frequency of EMR, zones irradiated and appeared nonspecific syndrome of adaptation (Selye's NSA.

Dependent on frequency effects play an important role in absorbing the MM EMR and they are appeared significantly while simple bioobjects (molecules, cell's .membranes, etc) are irradiated. Selye's NSA is conditioned by the fact, that MM EMR is a "new factor" for bioobjects living on the earth (space MM EMR is blocked with the water molecules of the atmosphere). While MM EMR is applied as a therapeutic factor irradiated zones play the main role (Golant M. et al 1989 Tchernyakov G. 1989, Teppone M. et al 1991).

That is skin of big joints, Zakharjin-Head's zones or acupoints (AP) that are irradiated more often during medical application of MM EMR (Rodshtatt I. 1989). AP tissues are high hydrated (Buvin G. et al 1984) and sensible to MM EMR (Andreyev E. et al 1985).

Up to now there is no any modern theory, which could provide to individualize AP for every patient or for every disease. Different theories of Traditional Chinese Medicine (TCM) describe specific and unspecific symptoms of acute and chronic diseases. So Acupuncture theory of TCM continues to be the best for individualization of acupoints.

Thus a new therapeutic method has been created. It is based on application of different biological effects of low intensive electromagnetic radiation of MM band and Acupuncture theory of Traditional Chinese Medicine. It was effective in treating various diseases, among which Gastric Polyps, Gastric and Duodenal Ulcers (Teppone M. et al 1991). Angina Pectoris (Krotenko A. et al 1991) etc.

Special medical devices have been designed and built; "ASKVIT". "Electronica-EHF" etc.

P-48

PEMF STIMULATION AFTER CURETTAGE OF SEMIMALIGNANT CYST

N. Pekaric-Nadj[1] and D. Djuric[2]. [1]Faculty of Technical Sciences, Institute for Computers, Automatics and Measurements, University of Novi Sad, Sq. of D. Obradovic 3, 21000 Novi Sad, Yugoslavia. [2]Clinic of Stomatology, Department of Oral Surgery, University of Novi Sad, 2100 Novi Sad, Yugoslavia.

The semimalignant mandible cyst (ameloblastoma) is not a very well defined disease. For its aggressiveness a surgery is required shortly after it is diagnosed. In our Department in total of 1000 surgical interventions per year there come approximately 1 to 2 cases. In our 10 years long experience we already met 15 cases which were solved by curettage causing fairly large (from 1 to 5 cm) bone defects. This group of cases we shall call controls.

Recent reports about successful treatments by means of the pulsating electromagnetic fields (PEMF) in orthopedics encouraged us to try to use PEMF after the curettage in order to improve healing process. This year (1991) we met two cases of ameloblastoma (diagnosed by orthopantomography (OFG) and histopathology analyses), sized 45mmx28mm (Case 1) and 10mmxl2mm (Case 2). In Case 1 teeth 44, 45 and 47 were pulled out and in Case 2 tooth 38 was extracted. Scraping out of bone was performed out of tumorous changes. Bone defect was modeled with a hand drilling machine and a wound has been tamponed with iodoform gauze. Each curettage was followed by 30 minutes a day PEMF stimulation. The stimulator generated pulse trains of frequency 72 Hz with magnetic field component of approximately constant peak value 1 mT in a region of mandible. In Case 1 the stimulation lasted 30 days. Post operative edema was minimal. Signs of paresthesia disappeared after three days (In controls 6-10 days). Wound had no secondary infection. The surface of the wound completely covered with epithelium after 21 days (In controls 4 weeks). Five months after the curettage the OPG showed intensive bone reparation especially in the region of corpus mandibullae. The bone defect reduced to a size 20mmx10mm. (In controls similar degree of bone reparation was observed after 6 to 11 months). In Case 2 the stimulation lasted 15 days, after which the wound completely covered with epithelium. Three months after the surgery the OPG showed that the bone defect was completely filled with a bone which was not different from the neighboring one. (In controls similar degree of bone reparation was observed after 4 months and longer.)

P-49

TREATMENT OF CHRONIC PELVIC PAIN WITH NON-THERMAL PULSED RADIO-FREQUENCY RADIATION

R. de Seze and L. Miro. Service Central de Medecine Nucleaire et Biophysique Medicale, CHRU, 30006 Nimes, France.

Chronic pelvic pain cannot be treated easily with common drugs or surgery. The involvement of the neurovegetative system in such pains suggests a possible action of electromagnetic fields on this pathology. A, preliminary study (number of women = 46), was performed with the EM field (Diapulse) applied at the solar plexus (400 Hz) and at the pelvis (160 Hz). Most patients showed a marked improvement. In line with these preliminary results, we are currently following these patients to evaluate the duration of the effect and we have started a new randomized double blind study in order to determine which of the two sites is more effective in the treatment.

Методика многозональной КВЧ-терапии

М. Теппоне, А. Кротенко

Миллиметровые волны в медицине
Сборник статей под ред. Акад. Н.Д. Девяткова и проф. О.В.Бецкого, М., 1991, Том. 2, с. 458-463
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МИЛЛИМЕТРОВЫЕ
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МЕТОДИКА МНОГОЗОНАЛЬНОЙ КВЧ ТЕРАПИИ

М.В.Теппоне, А.Н.Веткин, А.А.Кротенко,
О.И.Миляев, А.А.Калин, М.Д.Пильх

Крайне высокочастотная (КВЧ) терапия, в основе которой лежит использование различных биологических эффектов низкоинтенсивного электромагнитного излучения (ЭМИ) миллиметрового диапазона, является современным немедикаментозным методом лечения [1, 2].

С учетом литературных данных [3-6] можно выделить специфические эффекты, связанные с частотой ЭМИ, и неспецифические эффекты, связанные с зоной облучения и развитием общего адаптационного синдрома (ОАС). К настоящему времени накоплено достаточно теоретического и экспериментального материала, позволяющего предполагать, что при КВЧ терапии ведущее значение принадлежит зоне облучения [7, 8]. Частота ЭМИ определяет лишь особенности рецепции излучения водосодержащими структурами, коэффициент поглощения и отражения, а следовательно интенсивность раздражения облучаемой зоны. В последующем эффект воздействия реализуется с участием нейрогуморальной, иммунной и других систем макроорганизма [9, 10]. Причем, характер ответа существенно не отличается от такового, возникающего при воздействии других факторов электромагнитной и неэлектромагнитной природы [11].

Наиболее часто воздействию подвергаются области кожи, соответствующие точкам акупунктуры (ТА), зонам Захарьина-Геда и крупным суставам [10]. Однако с точки зрения традиционной китайской медицины (ТКМ) такое деление условно, поскольку любой участок кожной поверхности имеет связь с определенными ТА, "каналами" и органами [12-14]. Не вызывает сомнения участие рефлекторных механизмов в реализации лечебного действия КВЧ [15], но ТА это не только особенности иннервации, а достаточно сложная функциональная единица [16, 17], обеспечивающая взаимодействие внутренней и внешней сред организма.

Исследования последних десятилетий расширили научное понимание механизмов реализации лечебного воздействия на кожные покровы, однако это не привело к созданию современных рекомендаций по эффективному выбору тех или иных ТА. Применительно к иглотерапии вопрос индивидуализации зон воздействия уже решен в рамках ТКМ. Учитывая высокую гидратированность области ТА [18], а также тропность ЭМИ миллиметрового диапазона к водосодержащим структурам [19, 20], представляется целесообразным применение синдромного подхода ТКМ при проведении КВЧ терапии.

Изучение клинической картины заболевания для диагностики и адекватной терапии сохраняет свою актуальность и в наши дни [21]. Но, в отличие от современной медицины, в ТКМ анализ жалоб и анамнеза больного производится не для выделения нозологических форм, а для определения синдрома, позволяющего выбирать ТА, лекарственную терапию, давать диетические и профилактические рекомендации [12-14]. При этом у любого пациента можно выделить как неспецифические симптомы, являющиеся отражением ОАС и конституциональных особенностей больного, так и специфические, позволяющие определить "локальное" поражение, что в наибольшей степени соответствует понятию "нозологическая форма". В зависимости от остроты процесса преобладает та или иная группа симптомов. Чем острее начало, тем менее специфична клиническая картина, т.е. преобладает симптоматика ОАС. По мере стихания остроты заболевания на первый план выходят симптомы "локального" поражения, а затем и конституциональные особенности больного. Процесс формирования синдромного диагноза ТКМ существенно не отличается от установления нозологического диагноза современной медицины. Описание синдромов ТКМ представлено в соответствующей литературе. При этом синдромы, характеризующие ОАС, наиболее полно отражены в работах, посвященных "развитию внешнего фактора в шести каналах организма" пациента [12, 14, 22], а "нозологические" синдромы, встречающиеся при язвенной болезни и гастритах, описаны в [12, 14, 23]. Таким образом, на основании синдромного подхода ТКМ была разработана методика многозональной КВЧ терапии (МЗ КВЧ).

Применялся генератор Г4-142, позволяющий осуществить локальное воздействие на области ТА в режимах "индивидуальной" и фиксированной частот. При МЗ КВЧ использовалась частота

53,53 ГГц, соответствующая длине волны 5,6 мм генератора "Явь-I". Излучаемая мощность, не превышавшая 0,5 мВт, передавалась к области ТА посредством диэлектрического волновода. Для получения "возбуждающего" эффекта длительность воздействия варьировала от 2 до 5 минут, а для "торможения" - 20-25 минут. Количество и частота процедур КВЧ терапии определялись индивидуально с учетом динамики клинических проявлений.

Среди пациентов преобладали больные с язвенной болезнью желудка и двенадцатиперстной кишки. При сильном болевом синдроме допускался эпизодический прием альмагеля или ношпы в первые дни лечения. Проведено сравнение эффективности амбулаторного лечения язвенной болезни двенадцатиперстной кишки (ЯД) в случаях использования различных методик, а именно: с индивидуализацией частоты ЭМИ по методике, описанной в [24] (I-я группа, 5I человек), и с индивидуализацией зоны воздействия - МЗ КВЧ (2-я группа, 44 человека). В контрольную группу (3-я, 40 человек) вошли пациенты, которым проводилась комплексная лекарственная терапия в стационарных условиях. Больные основных и контрольной групп были сопоставимы по основным клинико-эндоскопическим критериям. Эффективность лечения оценивалась на основании эндоскопического исследования через 2 и 3 недели лечения. Статистический анализ проведен с использованием критерия Стьюдента. Во всех группах отмечалась положительная клиническая динамика, проявляющаяся в полном купировании или уменьшении выраженности основных жалоб (болевой и диспептический синдромы). Через 2 недели лечения полное заживление язвенного дефекта достигнуто в I-й группе у 3I,4±6,6%; во 2-й - у 65,9±7,2%, а в 3-й - у 52,5±8,0% больных. Через 3 недели - у 35,3±6,8%; 75,0±6,6%; 82,5±6,I% больных соответственно. Различия достоверны между I-й и 2-й группами ($p < 0{,}00I$), не достоверны между 2-й и 3-й группами ($p > 0{,}I$). Таким образом, результаты лечения позволяют говорить о преимуществе МЗ КВЧ перед методикой КВЧ терапии с индивидуализацией частоты ЭМИ. При этом индивидуализация зоны воздействия на основании синдромного подхода ТКМ позволяет получать результаты КВЧ терапии ЯД не хуже, чем комплексная лекарственная терапия аналогичных больных в стационарных условиях.

Проведено лечение I2 больных ИБС (стенокардия покоя и напряжения). Положительный эффект, проявляющийся в улучшении общего самочувствия, уменьшении частоты и интенсивности болевых приступов, снижении дозы антиангинального препарата и повышении толерантности к физической нагрузке, достигнут у 7 пациентов с Ш-IУ функциональным классом (по Канадской классификации). Причем, улучшение наступало через 3-5 процедур или 2-3 недели лечения. В дальнейшем состояние больных оставалось стабильным до конца курса (I,5-2 месяца). Отсутствовал положительный эффект у больных с П функциональным классом, а также при наличии операции аортокоронарного шунтирования в анамнезе. Всем больным ИБС проводилась МЗ КВЧ на фоне традиционной лекарственной терапии.

Учитывая отсутствие отрицательного влияния КВЧ терапии на основной и метастатический опухолевый процесс [25], проведено лечение 9 больных (мужчин 3, женщин 6) с полипозом желудка. Лечение начиналось после получения результатов эндоскопического и гистологического исследования. Применялась МЗ КВЧ. Процедуры проводились I-2 раза в неделю. Курс лечения продолжался I-4 месяца. У 8 пациентов наступило клинико-эндоскопическое улучшение, проявлявшееся в купировании болевого и диспептического синдромов, а также в уменьшении размеров и количества полипов до полного их исчезновения. Уменьшение полипа на I/3 получено у 2 больных, в 2 и более раз - у 2, а полное исчезновение одного и более полипов достигнуто у 4 пациентов.

Заключение. Для улучшения результатов КВЧ терапии необходима индивидуализация зон воздействия (МЗ КВЧ). Синдромный подход ТКМ обеспечивает эффективный выбор зон воздействия у больных с язвенной болезнью желудка и двенадцатиперстной кишки, ИБС стенокардией напряжения и покоя, полипозом желудка. Предполагается, что при КВЧ терапии ведущее значение принадлежит зоне воздействия, а не частоте ЭМИ. КВЧ терапия с индивидуализацией зон воздействия может найти широкое применение в комплексной терапии, основанной на принципах традиционной китайской медицины.

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EHF-Puncture: Extremely High Frequency (EHF)-Therapy and Syndromes of Traditional Chinese Medicine

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Zhang Zhongjing's Theory of "six channels" & Extremely High Frequency (EHF)-Therapy of Duodenal Ulcers

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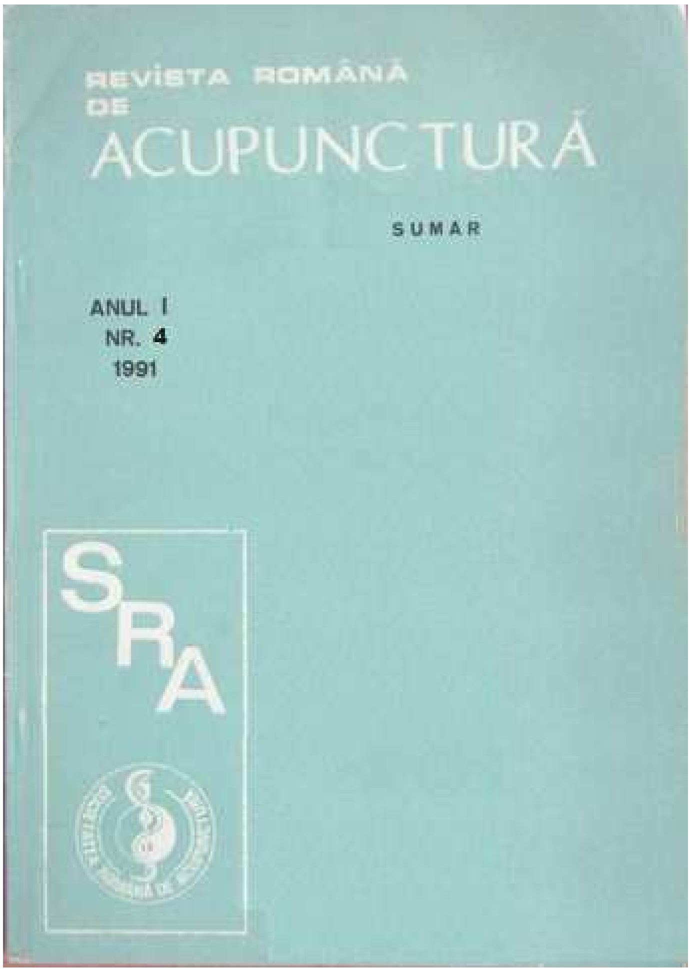

See # 80

Крайне Высокочастотная Терапия Дуоденальных Язв

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Ultrahigh Frequency Therapy of Duodenal Ulcers

M.Teppone, A.Vetkin, A.Kalin, A.Krotenko
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INTERNATIONAL SYMPOSIUM

MILLIMETER WAVES OF NON-THERMAL INTENSITY IN MEDICINE

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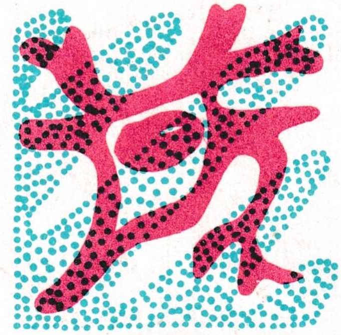

МЕЖДУНАРОДНЫЙ СИМПОЗИУМ

МИЛЛИМЕТРОВЫЕ ВОЛНЫ НЕТЕПЛОВОЙ ИНТЕНСИВНОСТИ В МЕДИЦИНЕ

3–6 октября 1991, Москва

Сборник докладов

Часть 1

МНОГОЗОНАЛЬНАЯ КВЧ-ТЕРАПИЯ ПОЛИПОВ ЖЕЛУДКА.

М. Теппоне, М. Пильх, А. Веткин, А. Кротенко
Временный научный коллектив "КВЧ" АН СССР
СССР 121002 Москва, пер. Вахтангова 4

Реферат. Многозональная КВЧ-терапия, основанная на синдромном подходе традиционной китайской медицины (ТКМ), обеспечивает эффективное лечение больных с полипами желудка (ПЖ). Через 1-4 месяца лечения у большинства пациентов отмечается клиническое улучшение, а также уменьшение размеров и количества ПЖ.

Введение. Многозональная КВЧ-терапия, основанная на синдромном подходе ТКМ позволяет осуществлять эффективное лечение различных заболеваний, в том числе и тех, для которых не решены вопросы этиопатогенеза, а консервативная терапия не разработана. Данное утверждение может быть продемонстрировано на примере лечения больных с полипами желудка.

Результаты и обсуждение. Полипы желудка относятся к доброкачественной опухоли слизистой оболочки желудка. Консервативная терапия не разработана. В настоящее время по отношению к ПЖ распространена выжидательная тактика или проводится оперативное лечение [1,2]. В отдельных случаях выявляется спонтанная положительная динамика [3,4].

Учитывая отсутствие отрицательного влияния КВЧ-терапии на опухолевый процесс (5), проведено лечение 13 (мужчин 4, женщин 9) больных с ПЖ в возрасте от 44 до 63 лет. Максимальная длительность заболевания (по эндоскопическому выявлению ПЖ) не превышала 5 лет.

Больные предъявляли жалобы, характерные для хронического гастрита и ПЖ: вздутие живота, ощущение полноты и тяжести в эпигастрии, иногда, распирающие боли в области желудка, снижение аппетита, тенденция к жидкому стулу и т.д. Диагноз подтвержден эндоскопически. Полипы локализовались в различных отделах желудка. У 8 человек выявлены одиночные полипы, у 5 - множественные. Максимальный размер полипа - 2,5 см. Гистологический диагноз: аденоматозный и гиперпластический полипы. Кроме того, у всех больных выявлялись атрофические и воспалительные изменения слизистой оболочки желудка.

Источником ЭМИ мм диапазона служил высокочастотный генератор Г4-142. Частота ЭМИ 53,53 ГГц, мощность излучения не превышала 0,5 мВт. Применялась многозональная КВЧ-терапия. В начале лечения, у большинства больных с наличием симптома вздутия живота (Пустота Лопродольного канала Селезенки) тонизировали ТА 3RP и рассеивали ТА 40E. В ряде случаев, после исчезновения вздутия живота появлялись умеренно выраженные боли в эпигастральной области (Полнота Лопродольного канала Селезенки). При этом проводилось рассеивание ТА 4RP. В конце лечения, для тонизации канала Селезенки использовались ТА 20V и 2RP. Процедуры проводились 1-2 раза в неделю. Курс лечения продолжался 1-4 месяца.

Уже после 2-3 процедур больные отмечали уменьшение выраженности, а затем полное исчезновение имевшихся симптомов. Эндоскопическое исследование выявило следующие результаты лечения:

- полное исчезновение одного и более полипов произошло у 5 человек или 38,4% случаев,
- уменьшение линейных размеров ПЖ в 2 и более раз - у 4 (30,8%),
- уменьшение линейных размеров ПЖ на 1/3 (23,1%),
- отсутствие положительной динамики - у 1 (7,6%).

Учитывая возможность спонтанного улучшения у больных с полипами желудка (3,4), проведен анализ динамического наблюдения в контрольной группе, состоящей из 10 человек с ПЖ. Этим больным КВЧ-терапия не проводилась. В течение 4-5 месяцев данного исследования какой-либо положительной динамики со стороны полипов выявлено не было.

Заключение. Таким образом, многозональная КВЧ-терапия позволяет осуществлять эффективное лечение больных с полипами желудка. Результаты нашего исследования дают возможность предполагать, что синдромный подход ТКМ для выбора зон воздействия при проведении КВЧ-терапии может быть успешно применен при широком круге заболеваний, в том числе и тех, где имеется затруднение с постановкой нозологического диагноза, не разработаны методы современного обследования и лечения, а также не решены вопросы этиопатогенеза.

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Polyzone EHF-Therapy of Gastric Polyps

M. Teppone, M. Pilkh, A. Vetkin, A. Krotenko

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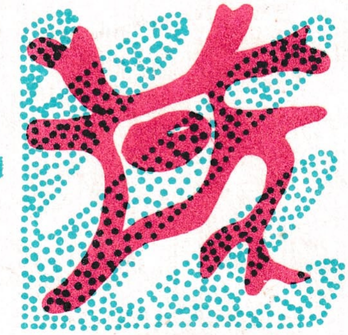

МЕЖДУНАРОДНЫЙ СИМПОЗИУМ

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3–6 октября 1991, Москва

Сборник докладов

Часть 1

КВЧ-ТЕРАПИЯ ДУОДЕНАЛЬНЫХ ЯЗВ.

М.В. Теппоне, А.Н. Веткин, А.А. Кротенко, А. А. Калин
Временный научный коллектив "КВЧ" АН СССР
СССР 121002 Москва, пер. Вахтангова 4

Введение. Широкое распространение язвенной болезни, осложнения при проведении лекарственной терапии, и повышение риска возникновения злокачественных новообразований после операций стимулируют поиск консервативных немедикаментозных методов лечения. К таким альтернативным направлениям относится и крайне высокочастотная терапия (КВЧ-терапия) /1-3/.

Несмотря на отдельные публикации, в которых высказываются сомнения относительно эффективности КВЧ-терапии /4/, нельзя не отметить ряд важных особенностей применения данного метода у больных с обострением язвы желудка и двенадцатиперстной кишки. У большинства пациентов клинические проявления обострения устраняются уже после первых лечебных процедур: восстанавливается аппетит, нормализуется сон, улучшается общее самочувствие, что сопровождается положительной динамикой электрической активности головного мозга, нормализацией кислотопродуцирующей и двигательной активности желудка и двенадцатиперстной кишки. Устраняются гастроэзофагеальный и дуоденогастральный рефлюксы, исчезают имевшиеся термографические изменения в области передней брюшной стенки, восстанавливается нормальное взаимоотношение между перекисным окислением липидов и антиоксидантной системой организма. Отмечается положительная динамика реологических свойств крови, иммунологического статуса организма и состояния ферментных систем нейтрофильных лейкоцитов. Нормализуется содержание гормонов и нейропептидов в крови. Высок процент элиминации кампилобактерий из зоны язвенного дефекта. Исследование биопсийного материала слизистой оболочки желудка и двенадцатиперстной кишки позволило выявить нормализацию содержания в ней энзимов цикла Кребса и терминального окисления, исчезновение микроциркуляторных нарушений, изменение содержания циклического АМФ и простагландина E_2 в крови и биоптатах. Часто заживление язвенного дефекта происходило по типу краевой эпителизации или с формированием нежного соединительнотканного рубца.

Налажен серийный выпуск специальной медицинской аппаратуры ("Явь-1", "Электроника-КВЧ" и др.), позволяющей осуществлять воздействие на фиксированной и индивидуальной частотах на области зон Захарьина — Года и точки акупунктуры (ТА). Тем не менее нерешенность ряда методических вопросов ограничивает широкое внедрение КВЧ-терапии в клиническую практику.

Задачи настоящей работы — изучение возможности амбулаторной КВЧ-терапии язвенной болезни двенадцатиперстной кишки (ЯБДК) и выявление факторов, влияющих на эффективность лечения.

Материал и методы

Во время проведения текущих исследований (1987—1990), на базе ГКБ № 15 г. Москвы проведено амбулаторное лечение 95 больных (64 мужчин и 31 женщина) в возрасте от I4 до 59 лет. Максимальная длительность заболевания достигала 32 лет. Ежегодные обострения имели место у 85,2 % больных,Основные жалобы соответствовали типичному,для обострения ЯБД, течению заболевания /5, 6/. Диагноз ЯБД подтвержден эндоскопически. Источником ЭМИ ММ диапазона служил высокочастотный генератор Г4-I42, позволяющий осуществлять локальное воздействие на области кожной проекции точек акупунктуры (ТА) в режиме применения индивидуально выбранной и фиксированной частот ЭМИ. Излучаемая мощность,не превышавшая I мВт, передавалась к зоне облучения посредством диэлектрического волновода. В течении первых 2-3 дней лечения, при сохраняющемся болевом синдроме, допускался эпизодический прием альмагеля или но-шпы. Другие лекарственные средства отменялись. Курс КВЧ-терапии состоял из 5-I5 процедур, длительностью 20-30 минут.

Эффективность лечения оценивалась через 2 и 3 недели лечения: "Заживление" соответствовало рубцеванию или эпителизации язвенного дефекта,"Улучшение" - уменьшению линейных размеров язвы в 2 и более раз, в остальных случаях результат оценивался как "Без эффекта"."Положительный эффект" (ПЭ) включал "Заживление" и "Улучшение" через 3 недели лечения.При отсутствии ПЭ больные госпитализировались в одно из терапевтических отделений ГКБ № I5.

В I-й группе (n = 5I) проводилась КВЧ-терапия с индивидуальным подбором частоты ЭМИ /7/. Во время первой процедуры, в ручном режиме переключения, со скоростью 20 мГц/мин. осуществлялось сканирование частот в интервале 53,5-70,0 гГц. В большинстве случаев, у пациентов возникали различные сенсорные реакции, причем, не в месте воздействия, а в области условной локализации больного органа.Индивидуальной лечебной частотой (ИЛЧ) считалась частота ЭМИ, воздействие которой сопровождалось наиболее комфортными ощущениями. Найденная ИЛЧ и произвольно выбранная ТА (36Е, 6МС, 40Е и др.) не менялись на протяжении всего курса лечения.

Во 2-й группе (n = 44) проводилась КВЧ-терапия с индивидуальным подбором зоны воздействия - ТА. Жалобы больных и анамнез заболевания анализировались на основании синдромного подхода традиционной китайской медицины (ТКМ). Выявленный синдромный диагноз определял выбор ТА. В процессе лечения, при изменении жалоб, с учетом нового синдрома выбирались соответствующие ТА. За одну процедуру последовательно облучались 2-3 ТА. Для получения "возбуждающего" эффекта воздействие длилось не более 2-5 минут, а"тормозного" - 25-30 минут. Во 2-й группе использовалась фиксированная частота ЭМИ 53,53 гГц, т.е. длина волны 5,6 мм.

Контрольную группу, 3-ю ($n = 40$) составили пациенты, находившиеся на стационарном лечении в одном из терапевтических отделений ГКБ I5 по поводу обострения ЯБД. Комплексная терапия включала режим, диету, лекарственные средства и физиотерапевтические процедуры.

Больные основных и контрольной групп были сопоставимы по основным клинико-эндоскопическим критериям. Статистическую обработку результатов проводили с использованием критерия Стьюдента.

После проведенного лечения отмечалась положительная клиническая динамика, что сопровождалось достоверным снижением встречаемости основных жалоб, обусловленных обострением ЯБД.

В I-й группе заживление язвенного дефекта через 2 недели произошло у I6 (3I,4 ± 6,6 %) больных, через 3 недели - у I8 (35,3 ± 6,8 %). ПЭ достигнут у 58,8 ± 7,0 % больных. На ПЭ не оказали достоверного влияния такие факторы, как пол и возраст больного, длительность заболевания и частота ежегодных обострений, группа крови по системе АВ0 и наличие язвенной болезни у ближайших родственников. У больных с осложнениями в анамнезе ПЭ получен не был. При воздействии на ТА 36Е ПЭ достигал 7I,0 ± 8,3 %, а при воздействии на "другие ТА", т.е. не 36Е, ПЭ не превышал 40,0 ± II,2 %. Различия достоверны ($p < 0,05$).

Во 2-й группе заживление язвенного дефекта через 2 недели получено у 29 (65,9 ± 7,2 %), а через 3 недели - у 33 (75,0 ± 6,6 %) человек. ПЭ достигнут у 39 (88,6 ± 4,8 %) больных. В связи с высокой эффективностью лечения, во 2-й группе изучалось влияние различных факторов не на ПЭ, а на заживление через 2 недели лечения (Заживление-2). Выявлено, что пол и возраст больного, длительность заболевания и частота ежегодных обострений, наличие язвенной болезни у ближайших родственников и группа крови по системе АВ0, наличие осложнений в анамнезе не оказали достоверного влияния на Заживление-2. В то же время, наличие исходно имевшегося синдрома ТКМ, анализируемого с точки зрения "Теории шести каналов" /8, 9/ и отражающего особенности развития общего адаптационного синдрома, определяло результаты лечения. Наиболее часто среди больных с обострением ЯБД встречались синдромы Ян Мин*

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*-"Ян Мин" - русская транскрипция китайского названия синдрома

(I3 человек или 29,6 ± 7,0 %) и Цзюе Инь (20 человек или 45,4 ± 7,6 %). При этом, если исходно выявлялся синдром Ян Мин, характеризовавшийся хорошим аппетитом, жаждой, сухостью во рту, потливостью,запорами и желто-белым налетом на языке, Заживление-2 получено у I2 из I3 больных (92,3 ± 7,7 %). Среди больных с синдромом Цзюе Инь, куда вошли и пациенты с различными осложнениями в анамнезе, Заживление-2 отмечено в 60,0 ± II,3 % случаев.Различия в эффективности лечения больных с синдромами Ян Мин и Цзюе Инь достоверны ($p < 0,05$).

В контрольной группе заживление язвенного дефекта через 2 недели лечения достигнуто у 2I (52,5 ± 8,0 %), а через 3 недели - у 33 (82,5 ± 6,I %) человек. ПЭ достигнут у всех больных.

При сравнении эффективности лечения больных основных и контрольной групп (по критерию"Заживление язвенного дефекта через 2 и 3 недели лечения") выявлены достоверные различия между I-й и 2-й ($p < 0,00I$), I-й и 3-й ($p < 0,05$) группами. Между 2-й и 3-й группами достоверных различий не выявлено ($p > 0,05$).

Достоверные различия по ПЭ при воздействии на ТА 36Е и другие ТА в I-й группе больных, где индивидуализировалась частота ЭМИ и высокая эффективность КВЧ-терапии при индивидуализации зоны воздействия позволяют предположить,что ведущую роль в повышении эффективности лечения играет зона воздействия, а не частота ЭМИ.

Таким образом, I) КВЧ-терапия с индивидуальным подбором зон воздействия является эффективным методом лечения обострения язвенной болезни.

2) Синдромный подход традиционной китайской медицины обеспечивает эффективный выбор ТА при проведении КВЧ-терапии.

3) Анализируя клинические проявления обострения заболевания и выделяя синдром ТКМ, можно прогнозировать эффективность лечения и оптимальные сроки проведения контрольной фиброгастроскопии.

4) При проведении КВЧ-терапии, ведущее значение в достижении положительного результата, по-видимому, принадлежит зоне воздействия, а не частоте ЭМИ.

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SUMMARY

M.Teppone, A.Vetkin, A.Krotenko, A.Kalin

EHF-THERAPY OF DUODENAL ULCERS

Science Corporation "EHF"
4 Vakhtangov st. Moscow 121002 USSR

51 out-patients of Duodenal Ulcers (DU) received EHF-therapy with individual frequency of electromagnetic radiation (EMR). 44 out-patients of DU received EHF-therapy with individual zone-acupoints, which were selected in accordance with Zhang Zhongjing's theory of "Six Channels". 40 hospital patients of DU took medicinal therapy.

After 3 weeks of treatment gastroscopic examination showed, that ulcers were healed in 35,3; 75.0 and 82.5 %, respectively.

One suppose, that main role in increasing results of EHF-therapy plays zone irradiated, but not frequency of EMR.

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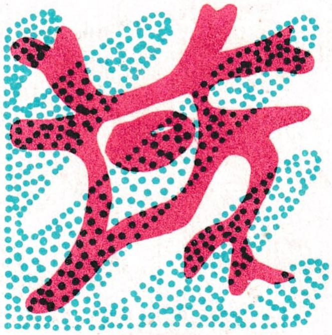
Part 1



МЕЖДУНАРОДНЫЙ СИМПОЗИУМ

МИЛЛИМЕТРОВЫЕ ВОЛНЫ НЕТЕПЛОВОЙ ИНТЕНСИВНОСТИ В МЕДИЦИНЕ

3–6 октября 1991, Москва

Сборник докладов

Часть 1

МНОГОЗОНАЛЬНАЯ КВЧ-ТЕРАПИЯ

М.В.Теппоне, А.Н.Веткин, А.А.Кротенко, О.И.Миляев
Временный научный коллектив "КВЧ" АН СССР
СССР I2I002 Москва, пер. Вахтангова 4

Реферат. Многозональная КВЧ-терапия является новым методом лечения, основанном на использовании низкоинтенсивного электромагнитного излучения (ЭМИ) миллиметрового (ММ) диапазона и акупунктурной теории традиционной китайской медицины(ТКМ). Соответствие между клиническими проявлениями различных заболеваний и синдромами ТКМ позволяет осуществлять эффективный выбор зон воздействия при проведении КВЧ-терапии.

Введение. Анализ литературы, посвященной проблеме использования в биологии и медицине низкоинтенсивного ЭМИ ММ диапазона /I-3/, позволяет выделить специфические эффекты, обусловленные частотой ЭМИ и неспецифические эффекты, связанные с облучаемой зоной и развивающимся общим адаптационным синдромом (ОАС). К настоящему времени накоплено достаточно теоретического,экспериментального и клинического материала,позволяющего предполагать, что при проведении КВЧ-терапии ведущую роль в повышении эффективности лечения играет зона воздействия,а не частота ЭМИ/4-6/. Частота ЭМИ определяет лишь особенности рецепции излучения водосодержащими структурами, коэффициенты поглощения и отражения, т.е. интенсивность раздражения облучаемой зоны. В последующем, эффект воздействия реализуется с участием нейрогуморальной, иммунной и других систем организма /7, 8/. Причем, характер ответа существенно не отличается от такового,возникающего при воздействии других факторов электромагнитной и неэлектромагнитной природы /9/.

Зоны воздействия. Наиболее часто,при КВЧ-терапии, воздействию подвергаются области кожи, соответствующие крупным суставам, зонам Захарьина-Геда и точкам акупунктуры /8/. Исследования последних лет расширили научное понимание механизмов реализации лечебного эффекта при воздействии на кожные покровы,но это не привело к формированию современных рекомендаций по выбору тех или иных точек акупунктуры (ТА). Применительно к иглотерапии вопрос индивидуализации зон воздействия уже решен в рамках ТКМ. Учитывая высокую гидратированность области ТА /I0/, а также тропность

ММ ЭМИ к водосодержащим структурам /II/, представляется целесообразным применение синдромного подхода ТКМ для индивидуализации зон воздействия при проведении КВЧ-терапии.

Синдромы ТКМ. У большинства пациентов, независимо от заболевания, можно выделить как неспецифические симптомы, отражающие конституциональные особенности больного и развитие ОАС, так и специфические симптомы, позволяющие определить нозологическую форму или "локальное" поражение. В зависимости от остроты процесса преобладает та или иная группа симптомов. Анализ различных теорий ТКМ позволяет выбрать группы синдромов, описывающих специфические и неспецифические симптомы острых и хронических заболеваний, что схематично отражено на рисунке.

А) Синдромы I-й группы:

Острые неспецифические симптомы, или симптомы, отражающие развитие ОАС, наиболее полно описаны в теории "Шести каналов" китайским врачом Zhang Zhongjing /I2-I4/. Согласно этой теории, при воздействии на человека различных метеофакторов ("Ветер", "Жара", "Холод") болезнь проходит шесть фаз своего развития от более поверхностного или более легкого поражения, к более глубокому, т.е. более тяжелому поражению. Каждому уровню соответствуют определенные клинические проявления и даны рекомендации по лечению. Если острое заболевание протекает только с симптомами "Жары", можно использовать теорию "Четырех слоев" доктора Je Gui, по которой развитие заболевания идет по четырем уровням: Wei, Qi, Ying, Xue. При "Сырости-Жаре" применяется теория "Тройного обогревателя" - "San Jiao". Синдромы I-й группы используются для лечения любых острых или обострения хронических заболеваний.

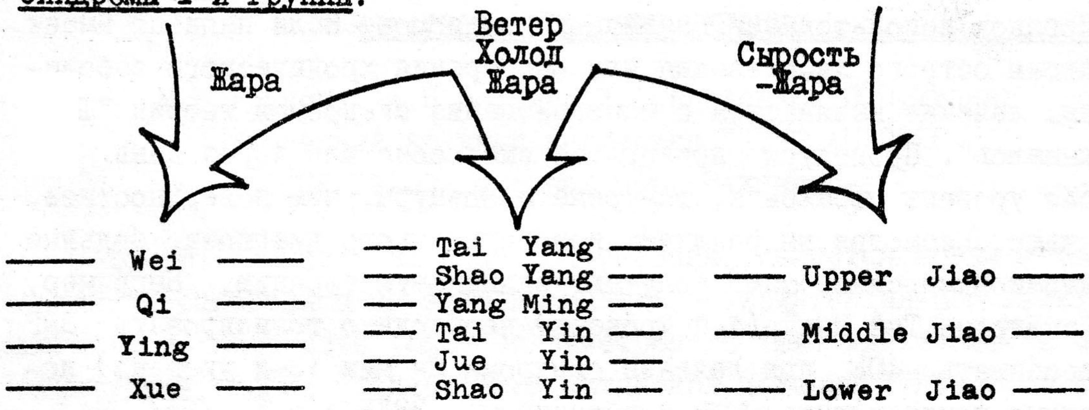
Б) Синдромы 2-й группы:

Специфические или "локальные" симптомы входят в синдромы заболеваний "Плотных и Полых Органов", "Каналов и Коллатералей". Эта группа синдромов применялась при лечении язвенной болезни, полипов желудка, бронхиальной астмы и др.

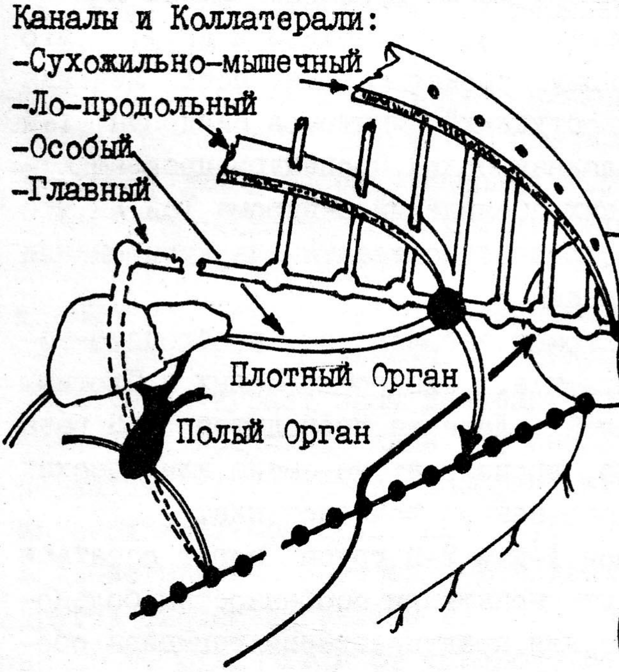
В) Синдромы 3-й группы:

Хронические неспецифические симптомы заболевания могут быть описаны с помощью синдромов "Пустоты Плотных Органов, Инь и Ян". Обычно они используются при лечении ИБС стенокардии, бронхиальной астмы, энурезов, запоров и других состояний и синдромов /I4/.

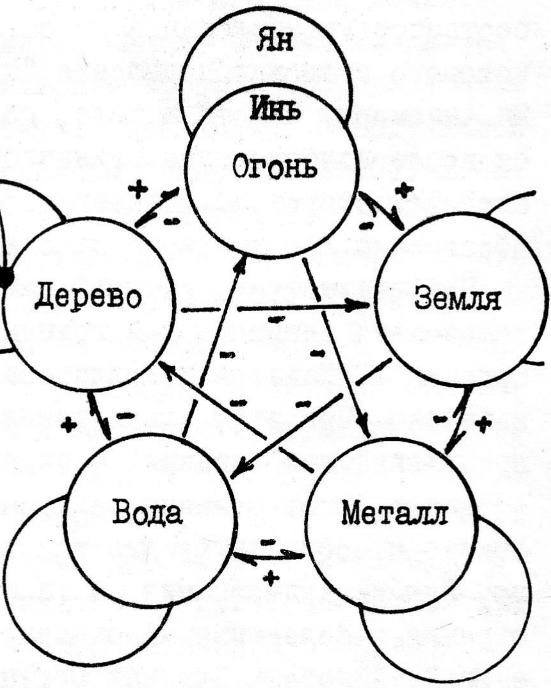
Синдромы I-й группы:


Ветер
Холод
Жара
Жара
Сырость
-Жара
Wei
Qi
Ying
Xue
Tai Yang
Shao Yang
Yang Ming
Tai Yin
Jue Yin
Shao Yin
Upper Jiao
Middle Jiao
Lower Jiao

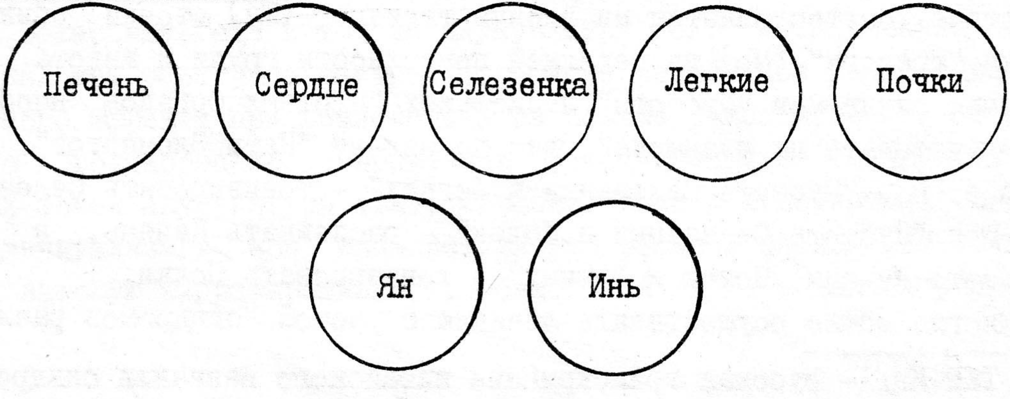
Синдромы 2-й группы:


Каналы и Коллатерали:
-Сухожильно-мышечный
-Ло-продольный
-Особый
-Главный
Плотный Орган
Полый Орган

Закон взаимодействия между "Пятью Элементами"


Ян
Инь
Огонь
Дерево
Земля
Вода
Металл
+
-

Синдромы 3-й группы:


Печень
Сердце
Селезенка
Легкие
Почки
Ян
Инь

Порядок использования различных синдромов. Если пациент имеет симптомы острого заболевания или обострения хронического заболевания, лечение начинается с использования синдромов теории "Шести каналов". Процедуры проводятся ежедневно или через день. Чем глубже уровень поражения, тем реже процедуры, чем поверхностнее, тем чаще. Несмотря на различия нозологического диагноза, больные с одинаковыми синдромами получают одинаковую терапию. Например, при синдроме Тай Инь[ж] (4-й уровень) необходимо тонизировать 3RP и рассеивать 40E, при лечении синдрома Ян Мин (3-й уровень) необходимо тонизировать 2RP и рассеивать 38УВ и т.д. /I5/. Нельзя забывать о том, что после лечения синдрома Ян Мин (сухость во рту, жажда, хороший аппетит, запор) может произойти смена клинических проявлений (потеря аппетита, тошнота, озноб и др.), что соответствует более поверхностному уровню Шао Ян, после лечения которого возможно появление "простудных" симптомов синдрома Тай Ян (насморк, ломота в теле, головная боль).Процедуры прекращаются после исчезновения клинических проявлений синдрома Тай Ян,что свидетельствует об излечении острого заболевания или купировании обострения хронического заболевания.

При отсутствии "острых" симптомов заболевания, необходимо использовать синдромы 2-й группы, т.е. синдромы "Полых и Плотных Органов", "Каналов и Коллатералей". Лечение проводится 2-3 раза в неделю. При этом, как правило, происходит не смена клинических проявлений заболевания, а их постепенное исчезновение.

После использования синдромов I-й и 2-й групп могут остаться симптомы,соответствующие конституциональным особенностям больного. Для их купирования, а также,для предупреждения рецидива обострения заболевания необходимо использовать синдромы "Пустоты Ян и Инь", "Пустоты Плотных Органов". Процедуры проводятся I раз в неделю и реже. Применяется Шу-Мо терапия, т.е.,в основном, воздействие осуществляется на "сочувственные" (Шу) точки спины и точки "тревоги" (Мо) на передней поверхности груди и живота. При наличии синдромов "Пустоты" нескольких "Плотных Органов", необходимо учитывать их взаимодействие по закону "Пяти Элементов". Например, при "Пустоте Селезенки и Легких" - тонизировать Селезенку, при "Пустоте Селезенки и Почек" - рассеивать Печень, а при "Пустоте Печени, Почек и Легких" - тонизировать Почки.

Иногда можно осуществлять лечение с учетом синдромов различ-

[ж] - Тай Инь - русская транскрипция китайского названия синдрома.

ных групп. Например, при наличии синдромов Ян Мин и Пустоты Инь Желудка на фоне Пустоты Инь, можно последовательно использовать следующие ТА: тонизировать 2RP, рассеивать 38УВ, затем тонизировать 42Е и рассеивать 44Е и 36Е и т.д.

ЭМИ ММ диапазона может применяться при лечении болезней "Полноты и Пустоты", "Жары и Холода". Модальность эффекта будет зависеть от длительности облучения. Для тонизации (Т) длительность воздействия на область ТА не превышает 5 минут, при этом необходимо дождаться появления первых специфических ощущений. Для рассеивания (Р) длительность воздействия может достигать 20-30 минут, необходимо дождаться появления, нарастания интенсивности и затем стихания специфических ощущений. Для "согревающего" эффекта длительность воздействия не превышает 2-3 минут. При этом отмечается появление ощущения тепла в зоне воздействия или в других частях тела, а также, происходит учащение пульса с 2-3 за I дыхательное движение (синдром Холода) до 5. Для "охлаждения" необходимо длительное воздействие до I5-30 минут. При этом отмечается появление ощущения "остывание внутри тела" и урежение частоты пульса с 7-8 ударов за одно дыхание (синдром Жары) до 5.

Используемые ТА облучаются в определенной последовательности, вначале воздействие осуществляется на ТА, требующие тонизирование, а затем - рассеивание (торможение).

Специфические ощущения. Согласно теории ТКМ лечебный эффект иглоукалывания, прижигания и гимнастики QI GONG зависит от выраженности и характера специфических ощущений,появляющихся у пациентов во время процедуры (феномен De Qi).Существует несколько типов De Qi.Первый тип De Qi - появление специфических ощущений в области воздействия. Второй тип - ощущения,распространяющиеся вдоль канала. И третий тип ощущений соответствует De Qi целого "канала" или Органа. Во время воздействия ЭМИ ММ диапазона на ТА наиболее часто возникают ощущения, соответствующие 2-му и 3-му типу De Qi.В начале процедуры могут появляться "волны", "мурашки", распространяющиеся вдоль туловища или конечностей. Затем у пациента возникают различные ощущения, отражающие устранение исходно имевшихся нарушений. Например, при синдроме "Пустоты Селезенки", на фоне тонизации 2RP,через I-3 минуты появляется ощущение "легкость в теле или в животе", "покачивание" и даже ощущение "парение над кушеткой". Если рассеивать ТА 44Е или 36Е у больного с синдромом "Жары в Желудке", то через I0-I5 минут появляется ощущение "остывание живота", исчезает сухость во рту, увеличивается отделение слюны. В некоторых случаях наблюдаются различные "зрительные ощущения", при этом, глаза закрытые. Как правило, чем больше ощущений возникало у пациентов во время процедуры, тем более выраженным и стойким был эффект лечения. Очень редко отмечалось клиническое улучшение, хотя специфические ощущения отсутствовали или были слабовыраженными.

Показания и противопоказания. Многозональная КВЧ-терапия использовалась при лечении различных заболеваний, в том числе, язвенной болезни /6/, ИБС стенокардии /I5/, полипов желудка /I6/, а также бронхиальной астмы, гипертонической болезни,энуреза, болевых синдромов и др. По-видимому, возможность постановки синдромного диагноза ТКМ является показанием к применению этого метода лечения.

Противопоказания не выявлены, хотя замечено снижение лечебного эффекта при наличии оперативных вмешательств в анамнезе.

Осложнения. При использовании многозональной КВЧ-терапии каких-либо осложнений, специфичных для воздействия ЭМИ ММ диапазона, замечено не было. Тем не менее, неправильно выбранный режим КВЧ-терапии (тонизация при синдромах "Полноты" или рассеивание при синдромах "Пустоты"), использование ТА, несоответствующих имеющемуся синдрому ТКМ, может приводить к усилению клинических проявлений заболевания или даже появлению новых жалоб.

Заключение. Можно надеяться, что дополнительное применение различных средств ТКМ должно повысить эффективность многозональной КВЧ-терапии.

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SUMMARY

M.Teppone, A.Krotenko, A.Vetkin

POLYZONE EHF-THERAPY: EHF-PUNCTURE

Science Corporation "EHF"
4 Vakhtangov st. Moscow 121002 USSR

Polyzone EHF-therapy or EHF-puncture is a new method of treatment, which is based on application of different biological effects of low power level (nonthermal) electromagnetic radiation of Millimetre range and Acupuncture theory of Traditional Chinese Medicine (TCM). Various theories of TCM let possibility to describe specific and nonspecific symptoms of acute and chronic diseases. Syndromes of TCM provide choosing acupoints for EHF-therapy.

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Whatever the drug used, aftertreatment levels of secretory salivary IgA and blood IgA dropped, blood IgD rose. Belomet treatment gave rise to higher titres of antibodies to oligopeptides. Solcoseril, cholinolytics with antacides led to increased bood levels of IgM and reduced levels of IgG. Recovery of the indices occurred in patients on enterodes. It is stated that changes in immunity depend both on ulcer healing and direct action of untiulcer drugs.

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М. В. Теппоне, А. Н. Веткин, А. А. Калин, А. А. Кротенко

КРАЙНЕ ВЫСОКОЧАСТОТНАЯ ТЕРАПИЯ ЯЗВЕННОЙ БОЛЕЗНИ ДВЕНАДЦАТИПЕРСТНОЙ КИШКИ

Временный научный коллектив «КВЧ» (руководитель — проф. О. В. Бецкий) АН СССР и ГКНТ СССР,
Городская клиническая больница № 15 (главный врач О. М. Филатов), Москва

Широкое распространение язвенной болезни, осложнения при проведении лекарственной терапии, повышение риска возникновения злокачественных новообразований после операций стимулируют поиск консервативных немедикаментозных методов лечения. К таким альтернативным направлениям относится и крайне высокочастотная терапия (КВЧ-терапия), основанная на использовании различных биологических эффектов искусственного низкоинтенсивного электромагнитного излучения (ЭМИ) миллиметрового диапазона [12, 13, 20].

В настоящее время предложены две гипотезы, в основном объясняющие механизмы лечебного действия КВЧ-терапии. Согласно первой, внешнее ЭМИ имитирует межклеточные сигналы связи, что приводит к нормализации функционирования органов и систем организма человека [4, 5]. Вторая гипотеза связывает первичную рецепцию ЭМИ миллиметрового диапазона с водосодержащими структурами и последующим изменением активности АТФ-синтетаз энергообразующих мембран, что сопровождается физиологическим эффектом стимуляции. Конечный результат воздействия формируется при участии нейрогуморальной, иммунной и других систем организма и зависит от области приложения ЭМИ [2].

Новый метод лечения оказался достаточно эффективным при лечении различных заболеваний органов пищеварения, сердечно-сосудистой, дыхательной и нервной систем [1, 12, 13, 20].

Несмотря на отдельные публикации, в которых высказываются сомнения относительно эффективности КВЧ-терапии [18], нельзя не отметить ряд важных особенностей применения данного метода у больных с обострением язвы желудка и двенадцатиперстной кишки. У большинства пациентов клинические проявления обострения устраняются уже после первых лечебных процедур [10]: восстанавливается аппетит, нормализуется сон, улучшается общее самочувствие [5], что сопровождается положительной динамикой электрической активности головного мозга [19], нормализацией кислотопродуцирующей [16] и двигательной активности желудка и двенадцатиперстной кишки [11]. Устраняются гастроэзофагальный и дуоденогастральный рефлюксы [14], исчезают имевшиеся термографические изменения в области передней брюшной стенки [7], восстанавливается нормальное взаимоотношение между перекисным окислением липидов и антиоксидантной системой организма [15]. Отмечается положительная динамика реологических свойств крови [15] иммунологического статуса организма [16] и состояния ферментативных систем нейтрофильных лейкоцитов [21]. Нормализуется содержание гормонов и нейропептидов в крови [8]. Высок процент элиминации кампилобактерий из зоны язвенного дефекта [17]. Исследование биопсийного материала слизистой оболочки желудка и двенадцатиперстной кишки позволило выявить нормализацию содержания в ней энзимов цикла Кребса и терминального окисления, исчезновение микроциркуляторных нарушений [9], изменение содержания циклического АМФ и простагландина E_2 в крови и биоптатах [8]. Часто заживление язвенного дефекта происходило по типу краевой эпителизации или с формированием нежного соединительнотканного рубца [15].

Налажен серийный выпуск специальной медицинской аппаратуры («Явь-1», «Электроника-КВЧ» и др.), позволяющей осуществлять воздействие на фиксированной и индивидуальной частотах на области зон Захарьина — Геда и точки акупунктуры (ТА). Тем не менее нерешенность ряда методических вопросов ограничивает широкое внедрение КВЧ-терапии в клиническую практику.

Задачи настоящей работы — изучение возможности амбулаторной КВЧ-терапии язвенной болезни двенадцатиперстной кишки (ЯБДК) и выявление факторов, влияющих на эффективность лечения.

Материал и методы

На базе Городской клинической больницы № 15 Москвы в 1988—1990 гг. проведено амбулаторное лечение 95 больных (мужчин 64, женщин 31) в возрасте от 14 до 59 лет. Максимальная длительность заболевания достигала 32 лет. Ежегодные обострения отмечались у 85,2 % больных.

Основные жалобы соответствовали типичному для обострения ЯБДК течению заболевания [3, 25]. Диагноз ЯБДК был подтвержден эндоскопически. Дополнительные инструментальные исследования не проводились, так как их результаты не влияли на методику лечения. Источником ЭМИ миллиметрового диапазона служил высокочастотный генератор Г4-142, позволяющий осуществлять локальное воздействие на области кожной проекции ТА в режиме применения индивидуально выбранной и фиксированной частот ЭМИ. Излучаемая мощность, не превышавшая 1 мВт, передавалась к зоне облучения посредством диэлектрического волновода. В течение первых 2—3 дней лечения в случае сохранявшегося болевого синдрома допускался эпизодический прием алмагеля или но-шпы. Другие лекарственные средства отменяли. Курс КВЧ-терапии состоял из 5—15 процедур длительностью 20—30 мин.

В связи с тем, что вероятность спонтанного заживления язвенного дефекта возрастает при увеличении сроков наблюдения [23], эффективность лечения оценивали лишь через 2 и 3 нед после его начала по данным фиброгастродуоденоскопии. Оценку проводили по следующим критериям: «заживление» — рубцевание или эпителизация язвенного дефекта, «улучшение» — уменьшение линейных размеров язвы в 2 раза и более; «без эффекта» — в остальных случаях. «Положительный эффект» (ПЭ) включал «заживление» и «улучшение» через 3 нед лечения. При отсутствии ПЭ больных госпитализировали в одно из терапевтических отделений больницы № 15.

В 1-й группе (51 больной) проводили КВЧ-терапию с индивидуальным подбором частоты ЭМИ [1]. Во время первой процедуры в ручном режиме переключения, со скоростью 5—20 мГц/мин осуществляли сканирование частот в интервале 53,50—70,00 гГц. В большинстве случаев у больных возникали различные сенсорные реакции, причем не в месте воздействия, а в области условной локализации больного органа. Индивидуальной лечебной частотой считалась частота ЭМИ, воздействие которой сопровождалось наиболее комфортными ощущениями (купирование болей, ощущение тепла, легкости и др.). Найденную частоту и произвольно выбранную ТА (36Е, 6МС, 40Е и др.) не меняли на протяжении всего курса.

Во 2-й группе (44 больных) проводили КВЧ-терапию с индивидуальным подбором зон воздействия. Жалобы больных и анамнез заболевания анализировали на основании синдромного подхода традиционной китайской медицины (ТКМ) [22, 24, 26, 27], причем методически постановка синдромного диагноза мало отличалась от постановки нозологического диагноза. Выявленный синдромный диагноз определял выбор ТА. В процессе лечения, при изменении клинических проявлений заболевания с учетом нового синдрома ТКМ выбирали необходимые ТА на основании рекомендаций [24]. За одну процедуру последовательно «облучали» 2—3 ТА. Для получения возбуждающего эффекта воздействие длилось не более 5 мин, тормозного эффекта — 20—30 мин. В этой группе использовали фиксированную частоту ЭМИ 53,53 гГц, что соответствует длине волны 5,6 мм.

Контрольную, 3-ю группу (40 больных) составили пациенты, находившиеся на стационарном лечении в одном из терапевтических отделений больницы по поводу обострения ЯБДК. Комплексная терапия включала режим, диету, лекарственные средства [традиционные холинолитики — атропин, платифиллин; антациды — алмагель, викалин; спазмолитики — папаверин, но-шпа; новые противоязвенные препараты — сукральфат (альсукраль) или ацилок Е] и физиотерапевтические процедуры (электросон, электрофорез с различными лекарствами, ванны и др.).

Больные всех 3 групп были сопоставимы по основным клинико-эндоскопическим критериям. Статистическую обработку проводили с использованием критерия Стьюдента.

Результаты и обсуждение

В 1-й и 2-й группах на фоне проводимой КВЧ-терапии отмечалась положительная клиническая динамика — достоверное уменьшение частоты основных жалоб, обусловленных обострением ЯБДК (см. таблицу).

Изменение частоты жалоб у больных ЯБДК в результате лечения (M±m)

Симптом	1-я группа ($n=51$)					2-я группа ($n=44$)				
	до лечения		после лечения		p	до лечения		после лечения		p
	абс.	%	абс.	%		абс.	%	абс.	%	
Боли в животе	44	86,3±4,9	27	52.9±7,1	<0,001	40	90,1±4,6	8	18,2±5,9	<0,001
Отрыжка	23	45,1±7,0	15	29,4±6,4	>0,05	25	59,1±7,5	10	22,7±6,4	<0,001
Изжога	22	43,1±7,0	11	21,6±5,8	<0,05	13	29.5±7,0	1	2,3±2,3	<0,001
Тошнота	22	43,1±7,0	3	5,9±3,3	<0,001	20	45,5±7,6	1	2,3±2,3	<0,001
Снижение аппетита	14	27,5±6,3	5	9,8±4,2	<0,05	17	38.6±7,4	2	4,5±3,2	<0,001
Рвота	11	21,6±5,8	2	3,9±2,7	<0,001	7	15,9±5,6	0	0	<0,01
Изменение частоты стула	26	51,0±7,1	12	23.5±6,0	<0,01	29	65,9±7,2	6	13,6±5,2	<0,001

В 1-й группе заживление язвенного дефекта через 2 нед произошло у 16 (31,4±6,6 %) больных, через 3 нед — у 18 (35,3±6,8 %). ПЭ получен у 58,8±7,0 % больных, что совпадает с результатами лечения язвенной болезни в ВНЦХ АН СССР [6], где применяли аналогичную методику КВЧ-терапии. На ПЭ не оказали достоверного влияния такие факторы, как пол, возраст больных, длительность заболевания и частота ежегодных обострений, группа крови по системе АВ0 и наличие язвенной болезни у ближайших родственников. В то же время у больных с осложнениями течения ЯБДК в анамнезе ПЭ не получен. При воздействии на ТА 36Е ПЭ достигал 71,0±8,3 %, а при воздействии на другие ТА — 40,0±11,2 %. Для ТА 36Е наиболее «благоприятными» интервалами частот ЭМИ были 53,50—56,49 и 58,00—59,49 ГГц (рис. 1).

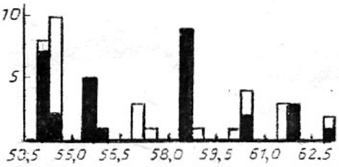

Рис. 1. Эффективность лечения больных 1-й группы в зависимости от используемых ТА и интервала частот ЭМИ.

По оси абсцисс — интервалы частот ЭМИ, мГц, по оси ординат — количество больных; первый столбец каждого интервала — больные, у которых воздействие осуществляли на ТА 36Е, второй — на другие ТА; темная часть столбца — больные с ПЭ через 3 нед лечения, светлая — больные без эффекта.

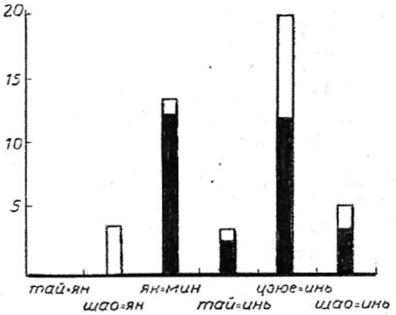

Рис. 2. Эффективность лечения больных 2-й группы в зависимости от имеющегося синдрома ТКМ.

По оси абсцисс — синдромы ТКМ, по оси ординат — количество больных; темная часть столбца — больные с заживлением язвы через 2 нед лечения, светлая — больные, у которых отсутствовало полное заживление через 2 нед.

Во 2-й группе заживление язвенного дефекта через 2 нед произошло у 29 (65,9±7,2 %) больных, а через 3 нед — у 33 (75,0±6,6 %) больных. ПЭ достигнут в 39 (88,6±4,8 %) случаях. В связи с достаточно высокой эффективностью лечения во 2-й группе изучали влияние различных факторов не на ПЭ, а на заживление язвенного дефекта через 2 нед лечения. Установлено, что пол и возраст больных, длительность заболевания и частота ежегодных обострений, наличие язвенной болезни у ближайших родственников и группа крови по системе АВ0 не оказали достоверного влияния на заживление язвы в этот срок. В то же время наличие исходно имевшегося синдрома ТКМ, анализируемого с точки зрения «теории шести каналов» [24, 26] и отражающего особенности развития общего адаптационного синдрома, определяло результаты лечения. Наиболее часто у больных с обострением ЯБДК встречались синдромы ян-мин* (13 больных; 29,6±7,0 %) и цзюе-инь (20 больных; 45,4±7,6 %). При этом исходном выявлении синдрома ян-мин, характеризующегося, кроме основных проявлений обострения заболевания, такими неспецифическими признаками, как хороший аппетит, жажда, потливость при небольшой физической нагрузке, плохая переносимость жары, запор, бело-желтый налет на языке, заживление через 2 нед лечения было достигнуто у 12 из 13 больных (92,3±7,7 %). Среди пациентов с синдромом цзюе-инь, в число которых вошли и больные с различными осложнениями ЯБДК в анамнезе, заживление язвы через 2 нед отмечалось у 60,0±11,3 %. Различия в эффективности лечения больных с синдромами ян-мин и цзю-инь достоверны (p<0,05) (рис. 2).

В контрольной группе заживление язвенного дефекта через 2 нед достигнуто у 21 (52,5±8,0 %) больных, через 3 нед — у 33 (82,5±6,1 %) больных. ПЭ получен у всех больных.

Таким образом, результаты проведенных исследований позволяют считать КВЧ-терапию с индивидуальным подбором зон воздействия эффективным методом амбулаторного лечения обострения ЯБДК. Сравнение эффективности КВЧ-терапии в основных группах показывает достоверно (p<0,001) более высокие частоту рубцевания язвенного дефекта через 2 и 3 нед лечения и ПЭ у больных 2-й группы, чем 1-й. При сравнении 2-й и контрольной групп достоверных различий по критерию «заживление» через 2 и 3 нед лечения не выявлено (p>0,1).

Достоверные различия по ПЭ (p<0,05) при воздействии на ТА 36Е (71,0±8,3 %) и другие ТА (40,0±11,2 %) среди больных 1-й группы, где индивидуализировалась частота ЭМИ, а также высокая эффективность КВЧ-терапии при индивидуализации зон воздействия позволяют предположить, что при КВЧ-терапии ведущее значение в повышении эффективности лечения принадлежит зоне воздействия, а не частоте ЭМИ. Синдромный подход ТКМ обеспечивает эффективный выбор ТА и позволяет отбирать больных, у которых амбулаторная КВЧ-терапия будет наиболее эффективной.

Учитывая высокую эффективность лечения и неинвазивность воздействия на ТА, что приобретает особую значимость в условиях нарастающей угрозы заражения вирусом СПИДа, можно надеяться на широкое внедрение в практическую медицину КВЧ-терапии с индивидуальным подбором зон воздействия.

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* Русская транскрипция китайского названия синдрома.

Выводы

1. КВЧ-терапия с индивидуальным подбором зоны воздействия является эффективным методом лечения обострения ЯБДК.

2. Синдромный подход традиционной китайской медицины обеспечивает эффективный выбор ТА при проведении КВЧ-терапии.

3. Анализируя клинические проявления обострения заболевания и выделяя синдромы ТКМ, можно прогнозировать эффективность лечения и оптимальные сроки проведения контрольной гастроскопии.

4. При проведении КВЧ-терапии ведущее значение в достижении положительного результата, по-видимому, принадлежит зоне воздействия, а не частоте ЭМИ.

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EHF THERAPY OF DUODENAL ULCER

M. V. Терропеnе, A. N. Vetkin, A. A. Kalin, A. A. Krotenko

Summary

Extremely high frequency (EHF) radiation was performed in 95 outpatients with duodenal ulcer. Individual choice of the exposure site can improve the treatment results. The syndrome-oriented approach of the Chinese conventional medicine warrants an effective choice of the acupuncture loci and the prognosis of the outcome. A clinical syndrome was identified in which healing of the ulcer was achieved on week two of the treatment in 92.3±7.7 % of the patients. It is suggested that EHF therapy provides positive responses in case of a valid exposure zone selection, the frequency being less important.

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Л. В. Нечаева, С. Н. Белоконь, С. А. Булгаков

ОПЫТ КУРОРТНОЙ РЕАБИЛИТАЦИИ БОЛЬНЫХ В РАННИЕ СРОКИ ПОСЛЕ ОБОСТРЕНИЯ ЯЗВЕННОЙ БОЛЕЗНИ ДВЕНАДЦАТИПЕРСТНОЙ КИШКИ

Объединенный санаторий «Красные камни»

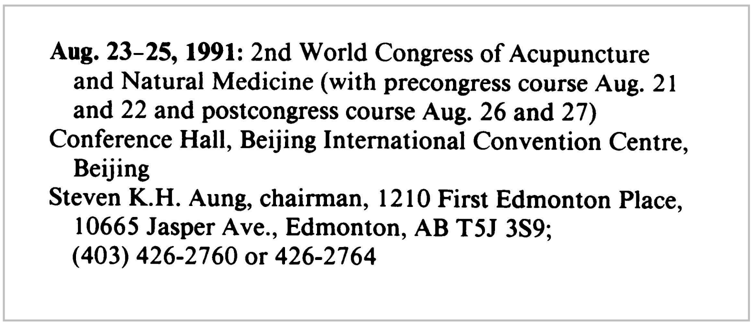
Высокая заболеваемость язвенной болезнью, особенно в работоспособном возрасте, рецидивы обострений, периодичность течения заболевания диктуют настоятельную необходимость совершенствования не только системы поэтапной восстановительной терапии, но и проведения комплекса лечебно-оздоровительных мероприятий, направленных на предотвращение у этих пациентов обострений язвенной болезни, более полное восстановление физической работоспособности и возвращение больного к его прежней активной профессиональной и общественной деятельности. Именно эти задачи, как отмечают большинство авторов [1, 7], положены в основу программы реабилитации перенесших обострение заболевания.

Многообразие проявлений язвенной болезни,

Zhang Zhongjing’s Theory of «six channels» & Extremely High Frequency (EHF)-Therapy of Duodenal Ulcers

M.Teppone, A.Krotenko

The 2nd World Congress of Medical Acupuncture and Natural Medicine
August 23-25, 1991, International Conventional Centre, Beijing, China (abstracts), p. 37-38



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See # 80

Крайне Высокочастотная Терапия Дуоденальных Язв

М.Теппоне, А.Веткин, А.Калин, А.Кротенко
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Ultrahigh Frequency Therapy of Duodenal Ulcers

M.Teppone, A.Vetkin, A.Kalin, A.Krotenko
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Extremely High Frequency (EHF)-Therapy and Syndromes of Traditional Chinese Medicine in Treatment of Gastric Polyps

M.Teppone, A.Krotenko

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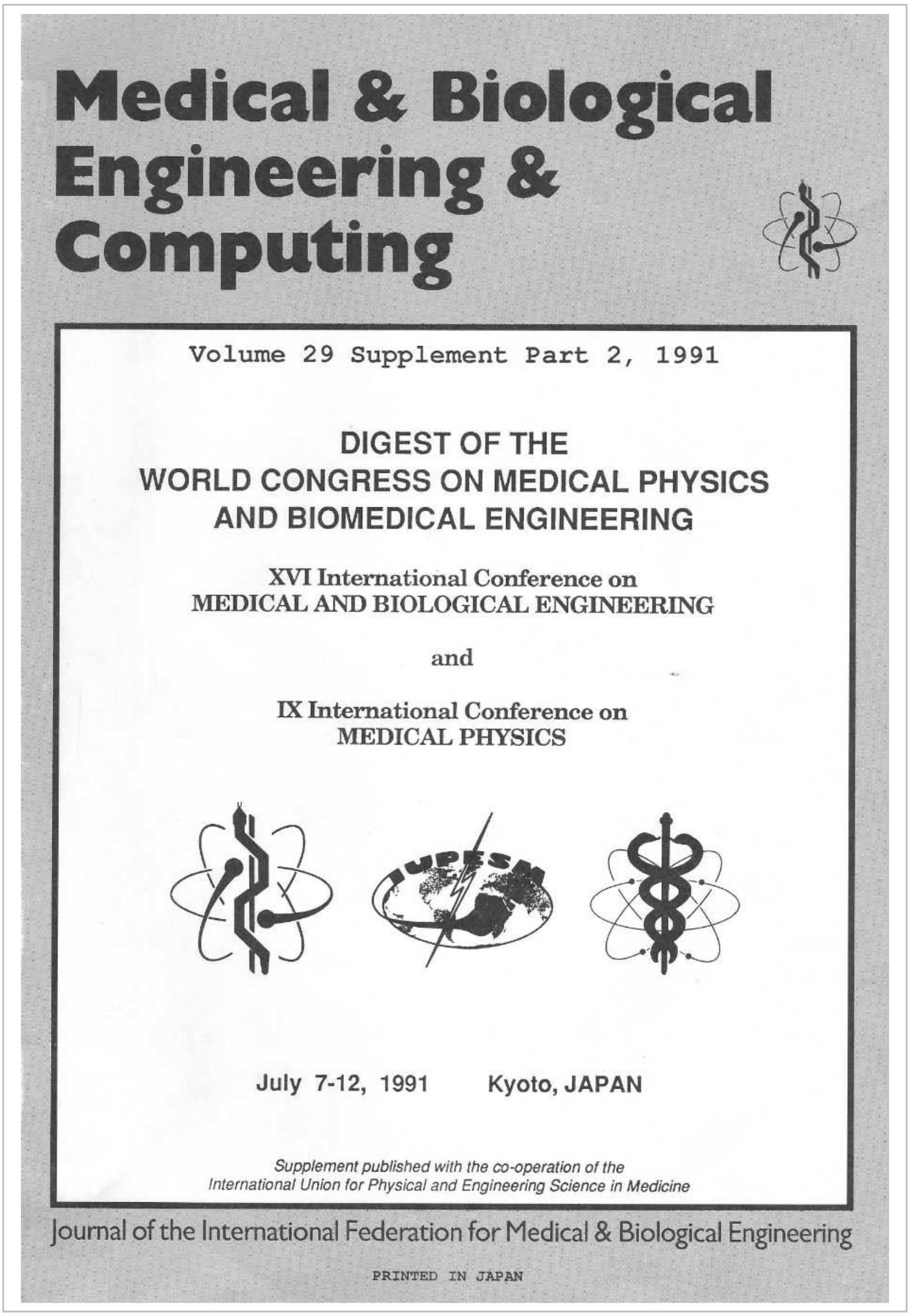

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FURTHER INVESTIGATION OF GASTRIC IMPEDANEC METHOD FOR DETECTING GASTRIC CONTRACTILE ACTIVITY FROM BODY SURFACE

Chen Ri Xin, Ding Tao, Wan Dong Ru, Zou Xiao Xue
Department of Acupuncture, Jiangxi college of Traditional Chinese Medicine,
Nangchang, P. R. of CHINA

We analyzed gastric impedance trace between 2—4 cpm further to examine the reliability of gastric impedance method for detecting gastric contractile activity from body surface.

[Methods] Subjects fasted overnight, four Ag—Agcl surface electrodes were placed on upper abdomen. A small constant current of 4 mA peak—to—peak at a frequency of 100KHz is applied to one pair of electrodes and the voltage variations, consequent on gastric contractile activity, detected on the other. Then the signals were amplified、demodulated、filtered (1—6cpm active band pass filter to exclude much respiratory and cardiac interference) and recorded to produce a gastric impedance trace regarding gastric contractile activity. In 85 healthy volunteers and 60 patients with chronic superficial gastritis, gastric impedance traces before and after meal、with and without metoclopramide and domperidone、before and after upper abdominal discomfort being of occurrence were recorded respectively.

[Results] Healthy volunteer's gastric impedance trace shows 2．8～3．1 cpm frequence、0．12～0．24 Ω amplitude and 2．9～3．2 cpm、0．15～0．30 Ω regular wave before and after meal respectively.

After metoclopramide(20 mg) were administered by mouth healthy volunteer's gastric impedance amplitude and frequence increased respectively and it was the same with domperidone (20 mg). Gastric dysrhythmia could be adjusted after domperidon by mouth.

Gastric impedance trace consequent on abdominal discomfort in patients with chronic superficial gastritis was completely different from gastric impedance trace before discomfort being of occurrence. gastric dysrhythmia was of frequent occurrence in most of patients with upper abdominal discomfort.

[Concluding Remarks] gastric impedance method could detect gastric contractile activity from body surface. It is reliable、accurate and completely non—invasive technology.

PP-2-554-14-10

EXTREMELY HIGH FREQUENCY (EHF)-THERAPY AND SYNDROMES OF TRADITIONAL CHINESE MEDICINE IN TREATMENT OF GASTRIC POLYPS.

Mikhail Teppone, Aleksey Krotenko
Corporation "Extremely High Frequency"/EHF/, Moscow, USSR

Extremely High Frequency (EHF)-Therapy is a new method of treatment which based on application of different biological effects of low level (non-thermal) electromagnetic radiation (EMR) of millimetre range.

13 patients of Gastric Polyps received EHF-therapy with individual zones for influence - acupoints, selected on the grounds of Acupuncture theory of Traditional Chinese Medicine.

The most patients had clinical manifestations which we considered to be syndromes "Deficiency or Excess of Spleen Luo -Channel" and "Damp-Heat in Stomach and Spleen".

After 4 months of treatment endoscopic examination showed that therapeutic effects were as follows: 5 cases (38,4%) with disappearance of one or more polyps, 4 cases (30,8%) with diminishing of polyps by more than half of theire original size, 3 cases (23,1%) cases with reduction of polyps by more than one third of their original size. Only 1 case with no obvious change of polyp. For example, patient K. 54 years old had 3 gastric polyps: 12, 14, 12 mm . 4 months later only one polyp 6 mm was revealed.

Министерство обороны СССР

Центральное военно-медицинское управление

Временный научный коллектив "КВЧ"
(ГКНТ СССР и АН СССР)

Научно-методический центр по организации
санаторно-курортного лечения и организованного
отдыха военнослужащих СА и ВМФ при Центральном
военном клиническом санатории "Архангельское"

ИНФОРМАЦИОННЫЙ СБОРНИК

1991 год, № 4, вып. 61

Избранные вопросы КВЧ-терапии в клинической практике

Москва - 1991

Методика многозональной КВЧ-терапии

М.В.Теппоне[ж]

Крайневысокочастотная (КВЧ) терапия, в основе которой лежит использование различных биологических эффектов электромагнитного излучения (ЭМИ) миллиметрового диапазона, является современным немедикаментозным методом лечения [7, 8].

С учетом литературных данных [II, I2, I3] можно выделить эффекты, связанные с частотой ЭМИ, зоной воздействия и общим адаптационным синдромом (ОАС), возникающим после облучения. К настоящему времени накоплено достаточно теоретического и экспериментального материала, позволяющего предполагать, что при проведении КВЧ-воздействия ведущее значение принадлежит зоне облучения при определенной частоте [6, I5, I8]. Частота ЭМИ определяет лишь особенности рецепции излучения водосодержащими структурами, коэффициент отражения, а следовательно, величину поглощения и интенсивность раздражения облучаемой зоны. В последующем эффект воздействия реализуется с участием нейрогуморальной, иммунной и других систем макроорганизма [I, I4]. Причем характер ответа существенно не отличается от такового, возникающего при воздействии других факторов электромагнитной и неэлектромагнитной природы [I9].

Наиболее часто воздействию подвергаются области кожи, соответствующие точкам акупунктуры (ТА), зонам Захарьина-Геда-Вильямовского и крупным суставам [I4]. Однако, с точки зрения традиционной китайской медицины (ТКМ), такое деление условно, поскольку

[ж] Об авторе: Теппоне Михаил Викторович, научный сотрудник ВНК "КВЧ".

любой участок кожной поверхности имеет связь с определенными ТА, каналами и органами [20, 2I, 23, 24]. Не вызывает сомнения участие рефлекторных механизмов в реализации лечебного действия КВЧ [5], но ТА - это не только особенности иннервации, а достаточно сложная функциональная единица, обеспечивающая взаимодействие внешней и внутренней среды организма и включающая высокогидратированную рыхлую соединительную ткань, обилие различных нервных, сосудистых и клеточных элементов [4]. Кроме того, имеется скопление щелевых соединений, обеспечивающих информационное межклеточное взаимодействие [I0].

Исследования последних десятилетий расширили научное понимание механизмов реализации лечебного воздействия на кожные покровы, однако это не привело к созданию современных рекомендаций по эффективному выбору тех или иных ТА. Применительно к иглотерапии и прижиганию вопрос индивидуализации зон воздействия уже решен в рамках ТКМ. Учитывая высокую гидратированность области ТА [2], а также тропность ЭМИ миллиметрового диапазона к водосодержащим структурам [9, I7], представляется целесообразным применение синдромного подхода ТКМ при проведении КВЧ-терапии.

У любого пациента, независимо от заболевания, можно выделить как неспецифические симптомы, являющиеся отражением формирования ОАС [I6] и конституциональных особенностей организма, так и специфические, позволяющие определить "локальное" поражение, что в некоторой степени соответствует понятию "нозологии".

В зависимости от остроты процесса преобладает та или иная группа симптомов. Чем острее начало, тем менее специфична клиническая картина, т.е. преобладает ОАС. По мере стихания остроты заболевания на первый план выходят симптомы "локального" поражения, а затем конституциональные особенности пациента. В случае постепенного начала заболевания, хронического течения наблюдается обратный порядок смены симптомов, что в ряде случаев, при адекватной терапии, сопровождается кратковременным обострением имевшегося заболевания.

Ниже приводятся основные группы синдромов, включающих специфические и неспецифические симптомы. Процесс формирования синдромного диагноза ТКМ существенно не отличается от установления нозологического диагноза современной медицины. Как правило, обнаруживается не весь набор симптомов какого-либо синдрома, кроме того, возможно сочетание нескольких синдромов. Для каждого синдрома приводятся рекомендации по выбору ТА и времени воздействия, при этом (в) - означает "возбуждать", что соответствует длительности КВЧ-воздействия не более 2-3 мин, а (т) - "тормозить" - соответственно до 20-25 мин.

Неспецифические синдромы, характеризующие ОАС

I. Тай Ян[ж]:
- затылочная головная боль,
- напряжение мышц шеи и спины,
- повышение температуры, жар,
- зябкость.

2. Шао Ян:
- чередование озноба и жара,
- односторонняя головная боль,
- потеря аппетита, тошнота, рвота, горечь по рту,
- сухость в горле или гиперсаливация,
- ощущение полноты в боковых отделах живота и груди,
- боли в области сердца и в животе,
- возможен жидкий стул,
- астматическое дыхание.

[ж] Русская транскрипция китайского названия синдрома.

3. Ян Мин : - хороший аппетит,
-сухость во рту, жажда,
- потливость,
- плохая переносимость жары,
- вздутие живота,
-запоры,
- язык покрыт желтоватым налетом.

4. Тай Инь: - отсутствие аппетита,
- тошнота, рвота слизью,
- боли в животе, тяжесть в теле,
- жидкий стул, возможно вздутие,
- язык с белым налетом,
- плохая переносимость холода,
- пульс менее 4 ударов за одно дыхательное движение.

5. Цзюе Инь: а) - чередование озноба и жара, поноса и рвоты,
- голод, но рвота после приема пищи,
- боли в области сердца,
- боли и напряжение в животе,
- холодные конечности;

б) - тенезмы, понос с кровью,
- рвота с кровью,
- горечь, сухость во рту без жажды,
- боли в подреберье и боковых отделах живота,
- боли и полнота в боковых отделах грудной клетки, боли в ребрах;

в) - рвота кислым и горьким содержимым,
- отсутствие аппетита,
- конечности мерзнут и немеют,

- боли и напряжение в животе,
- стул с непереваренной пищей.

6. Шао Инь: а)
- сонливость,
- плохая переносимость холода,
- холодные конечности,
- жидкий стул с непереваренной пищей,
- язык покрыт белым налетом,
- пульс менее 4 ударов за одно дыхательное движение;

б)
- раздражительность, бессонница,
- сухая кожа и горло,
- ощущение тепла внутри тела и в области сердца,
- боли в сердце,
- возможен жидкий стул,
- красный язык,
- пульс более 6 ударов за одно дыхательное движение.

Лечение:
- Тай Ян: IOP, 9P (т) + IRP, 2RP (в);
- Шао Ян: 42E (в) + 58У (т);
- Ян Мин: 2RP (в) + 38УВ (т);
- Тай Инь: 3RP (в) + 40E (т);
- Цзюе Инь: а) 9P, 2RP, 3RP (в);
  б) 3F (т);
  в) 3F, 8F, 2RP (в);
- Шао Инь: а) 42E (в) + 4RP (т);
  б) 2RP, 4IE, 36E (в).

Примечание: В прописях рецептов использовалось французское обозначение ТА, при этом:

P - канал Легких,
GI - канал Толстого кишечника,
E - канал Желудка,
RP - канал Селезенки,
C - канал Сердца
IG - канал Толстого кишечника,
IM - Передний срединный канал,
У - канал Мочевого пузыря
R - канал Почек,
MC - канал Перикарда,
TR - канал Тройного обогревателя,
УВ - канал Желчного пузыря,
F - канал Печени,
TM - Задний срединный канал.

В процессе правильного лечения происходит постепенная смена синдромов от Шао Инь до Тай Ян, что отражает благоприятное развитие заболевания. Нередко наблюдается пропуск некоторых синдромов. Лечение прекращается после купирования симптомов, относящихся к синдрому Тай Ян.

Лечение на основании синдромов, характеризующих ОАС, описано в работах по ТКМ в разделе, посвященном "Теории шести каналов" или "Шести фазам заболевания" [21, 22, 25].

Неспецифические конституциональные синдромы

"Пустота Сердца": - сердцебиение,
- беспокойство, снижение памяти,
- бессонница, кошмары во сне: 9C(в),15У(в).

"Пустота Селезенки": - снижение веса и аппетита,
- вязкий стул, диспепсия: 20У(в),
- полнота и урчание в животе: 2RP,3RP(в).

"Пустота Легких": - одышка, кашель,
- слабый голос, заикание: 9P(в),13У (в),
- выпадение волос, зябкость, потливость.

"Пустота Почек" : - слабость, боли в спине, боли в пятках,
- отеки, шум и звон в ушах: 7R, 3R(в),
- слабость, выпадение и болезни зубов.

"Пустота Печени": - ломкость ногтей, онемение конечностей,
- снижение остроты зрения, головокружение,
- сонливость, головная боль: 8F, 3F(в),I8У(в).

"Пустота Инь": - ощущение тепла в ладонях, стопах, сердце,
- сухость в горле, ночная потливость,
- ощущение прилива к лицу, красные скулы,
- темная моча, никтурия,
- язык красный: 7R, 6RP(в),
- пульс более 6 ударов за одно дыхательное движение.

"Пустота Ян": - непереносимость холода, импотенция,
- частое мочеиспускание, бесцветная моча,
- гиперпигментация кожи, жидкий стул: 23У, 4ТМ(в).

Специфические ("локальные") синдромы, характерные для обострения язвенной болезни и гастрита (по [26])

"Печень поражает Желудок": - полнота и напряжение в эпигастрии,
- иррадиация болей в подреберье,
- частая отрыжка, тошнота,горечь,
- раздражительность,
- ухудшение после психоэмоциональной нагрузки:2F(т), 3F(т), I4F(т).

"Пустота-Холод Желудка и Селезенки" - тупая, ноющая боль в эпигастрии,
- хуже натощак,

- улучшение от тепла и после еды,
- слабость, недомогание, утомляемость,
- жидкий стул, тошнота, нет аппетита,
- пульс менее 4 за одно дыхательное движение: 2RP(в), 36E(в), I2IM(в).

"Пустота Инь Желудка":
- тупая боль, жжение в эпигастрии,
- голод без аппетита,
- сухость в горле и во рту,
- запор, потливость ночью: 2F(т), 36E(т), 44E(т), 6RP(в), 7R(в).

"Сырость-Жара Желудка и Селезенки":
- распирающие боли в эпигастрии,
- ухудшение после приема пищи,
- горечь, неприятный привкус во рту,
- ощущение полноты в груди, слабость,
- тошнота, плохой аппетит, отрыжка,
- улучшение после рвоты: 44E, 36E(т), 3RP(т).

При отсутствии развернутого синдрома и наличии отдельных жалоб:

- боли в эпигастрии с иррадиацией к сердцу: I4F(т),
- изжога : 3F(т),
- отрыжка: 3RP(T), 2RP(в),
- запоры: сухой стул – 6RP и 7R(т), с затруднением дефекации и ощущением спазма ануса 2GI(т), без желания – 7P(в), 6GI(т),
- неопределенные боли или отсутствие жалоб: 36E (I0-I5 мин).

При обращении пациента с выраженной клинической картиной и небольшим сроком заболевания необходимо использовать синдромы, характеризующие ОАС. Процедуры проводятся ежедневно или, в случае быстрой смены симптомов, 2 раза в день. Длительность наличия симптомов, соответствующих тому или иному синдрому ОАС, может варьировать от нескольких часов до нескольких дней, что и будет определять продолжительность лечения.

Если после купирования ОАС сохраняются симптомы, характеризующие "локальные" ("нозологические") нарушения, используются синдромы, соответствующие определенной нозологической форме. Процедуры проводятся через 1-2 дня. При этом, как правило, не происходит смены клинических проявлений, а наблюдается постепенное исчезновение симптомов.

Коррекция конституциональных нарушений осуществляется не чаще 1 раза в неделю. Это позволяет предупредить ранние рецидивы заболевания. Кроме того, воздействуя на ТА с учетом синдромов "Пустоты", можно обеспечить профилактику возникновения заболевания.

В случаях хронического, вялотекущего, труднодифференцируемого заболевания лечение осуществляется в обратном порядке. Проводится коррекция конституциональных нарушений, затем "локальных", а при наличии обострения, смене симптомов лечение завершается на основании использования синдромов ОАС (см. схему на с. 137).

Возможно чередование и сочетание используемых синдромов. Например, у пациента клинические проявления соответствуют ОАС (Ян Мин), "локальный" синдром - "Пустота Инь Желудка", а конституциональный фон - "Пустота Инь". Тактика лечения может быть следующей: 1-я процедура: коррекция "Пустоты Инь" + ОАС (Ян Мин); 2-я: "Пустота Инь Желудка" + ОАС; 3-я: ОАС; 4-я: ОАС; 5-я: "Пустота Инь Желудка" + ОАС; 6-я: "Пустота Инь" + ОАС и т.д..

Данная методика КВЧ-терапии разработана для лечения язвенной болезни, полипоза желудка, ИБС, стенокардии. Кроме того, она оказалась эффективной при лечении бронхиальной астмы [4], энуреза [2], различных болевых синдромов и т.д.

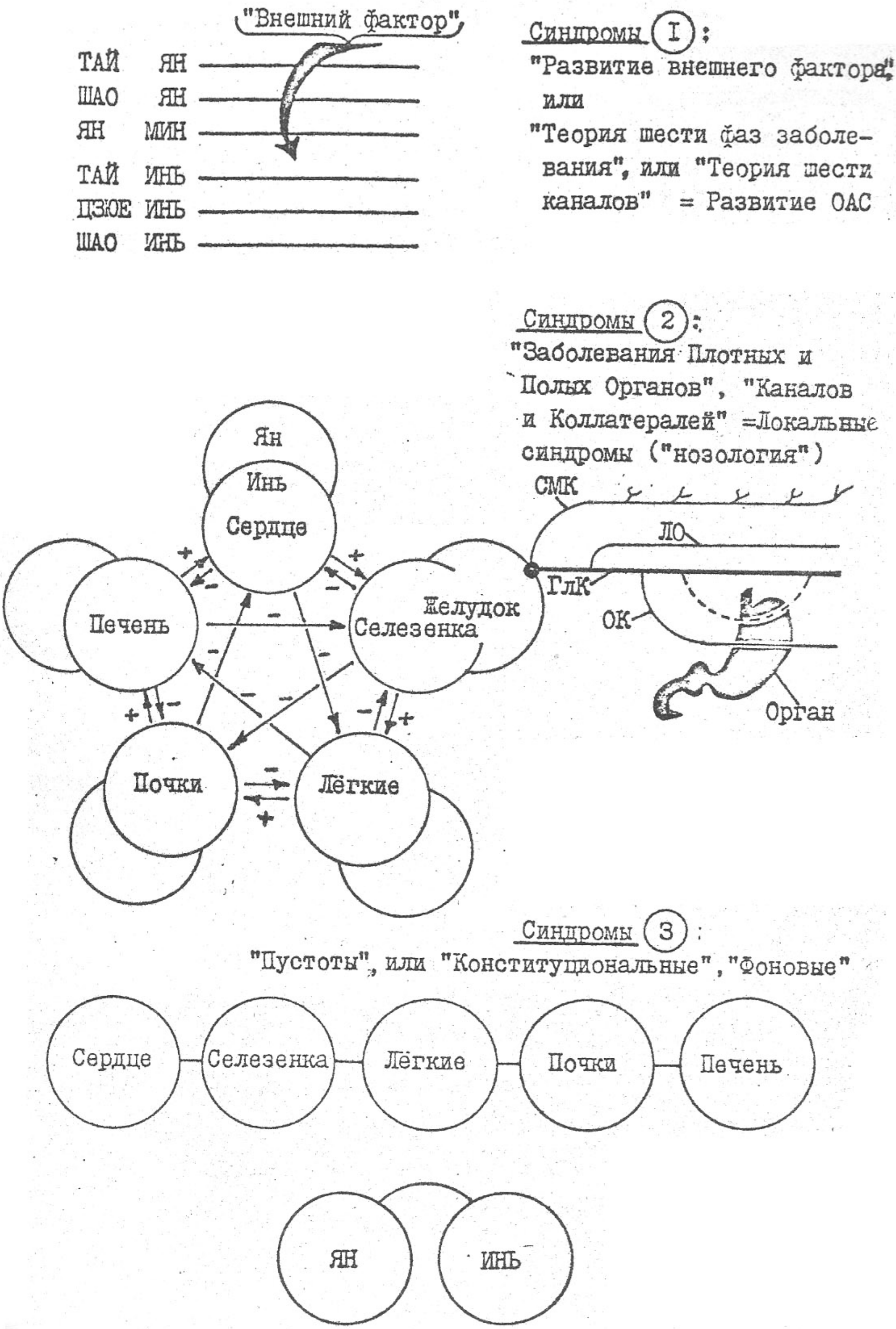
"Внешний фактор"
ТАЙ ЯН
ШАО ЯН
ЯН МИН
ТАЙ ИНЬ
ЦЗЮЕ ИНЬ
ШАО ИНЬ
Синдромы (I):
"Развитие внешнего фактора"
или
"Теория шести фаз заболевания", или "Теория шести каналов" = Развитие ОАС
Синдромы (2):
"Заболевания Плотных и Полых Органов", "Каналов и Коллатералей" =Локальные синдромы ("нозология")
СМК
ЛО
ГлК
ОК
Орган
Ян
Инь
Сердце
Печень
Желудок
Селезенка
Почки
Лёгкие
+
−
Синдромы (3):
"Пустоты", или "Конституциональные", "Фоновые"
Сердце
Селезенка
Лёгкие
Почки
Печень
ЯН
ИНЬ

Рис. Схема взаимоотношений между различными группами синдромов (пояснение к схеме см. на с. I38).

Противопоказания не выявлены, однако отмечается снижение эффективности у больных, перенесших оперативное вмешательство. У отдельных пациентов отмечалось усиление болевого синдрома и увеличение язвенного дефекта при неадекватном лечении в связи с неправильной оценкой синдрома ТКМ, что наиболее вероятно при отсутствии жалоб.

При КВЧ-терапии не применяются психотропные препараты и холинолитики. При наличии сохраняющегося болевого синдрома у больных язвенной болезнью возможно назначение таких препаратов, как альмагель (в случае тенденции к жидкому стулу), викалин (при запорах), но-шпа. Ожидается потенциирование эффективности лечения при назначении лекарственных препаратов ТКМ.

Пояснение к схеме

Синдромы I: согласно ТКМ,данные синдромы характеризуют внедрение "Внешнего Фактора" в организм человека и его развитие на уровне шести каналов. С современной точки зрения, это соответствует влиянию гелиокосмических и геофизических факторов и развитию общего адаптационного синдрома. Лечение с использованием данного типа синдромов применяется в случае острого начала заболевания, его бурного развития, выраженной клинической картины.

Синдромы 2: описывают заболевания "Плотных и Полых Органов", главных (ГлК), сухожильно-мышечных (СМК), особых (ОК) и ЛЮ-каналов. На схеме представлены принципы взаимодействия между органами, так, "+" означает тонизирующее влияние, а "-" - тормозящее. Это позволяет при заболевании нескольких органов определять локализацию первичного и вторичного поражения. Например, если имеются клинические проявления снижения активности Селезенки, необходимо ее тонизировать, воздействуя на возбуждающую ТА (2RP).

Если снижена активность Селезенки и Легких, необходимо тонизировать Селезенку, при этом произойдет тонизация как Селезенки, так и Легких. Если снижена активность Селезенки и Почек, необходимо тормозить Печень (2Р), что приведет к снижению тормозящего влияния Печени на Почки и Селезенку и соответственно к их тонизации. Выделение синдромов Органов и Каналов фактически отражает различные уровни регуляции организма. Для синдромов данного типа наиболее приемлемо современное понятие "нозология". В данной методике описаны синдромы, наиболее часто встречающиеся при обострении язвенной болезни и гастрита. При лечении других заболеваний необходимо вносить дополнения, соответствующие имеющимся клиническим проявлениям.

Синдромы 3: отражают конституциональные особенности пациента, связанные с врожденной или приобретенной неполноценностью то-то или иного органа, при этом понятие "Орган" в ТКМ имеет более широкое значение, чем анатомическое образование. Наиболее общими синдромами являются "Пустота Инь" и "Пустота Ян", которые можно соотнести с современным понятием снижения активности парасимпатического или симпатического отделов вегетативной нервной системы (однако это соотнесение несколько условно и не отражает полностью взаимоотношения между Инь и Ян ТКМ). Использование данной группы синдромов имеет значение при лечении хронических, вялотекущих заболеваний.

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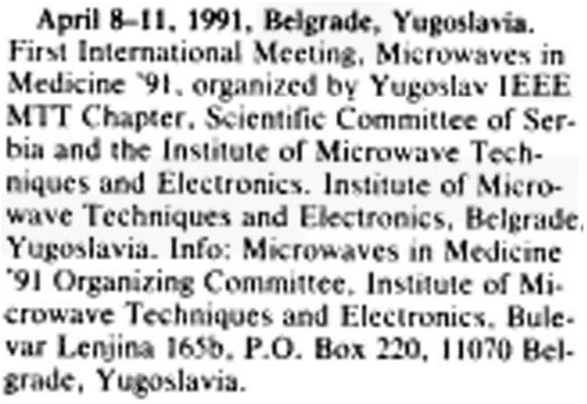
Extremely High Frequency (EHF) - Therapy of Duodenal Ulcers

M.Teppone, A.Krotenko. A.Vetkin

Microwaves in Medicine 1991: International Scientific Meeting
April 8-11, 1991, Belgrad, Yugoslavia. p. 108-116



April 8–11, 1991, Belgrade, Yugoslavia. First International Meeting, Microwaves in Medicine '91, organized by Yugoslav IEEE MTT Chapter, Scientific Committee of Serbia and the Institute of Microwave Techniques and Electronics. Institute of Microwave Techniques and Electronics, Belgrade, Yugoslavia. Info: Microwaves in Medicine '91 Organizing Committee, Institute of Microwave Techniques and Electronics, Bulevar Lenjina 165b, P.O. Box 220, 11070 Belgrade, Yugoslavia.

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Meeting Calendar. – In: *Aviation, Space and Environmental Medicine*, 1991, 62(1): 280

See # 80

Крайне Высокочастотная Терапия Дуоденальных Язв

М.Теппоне, А.Веткин, А.Калин, А.Кротенко
Клиническая медицина, 1991, 69, 10, с. 74-77
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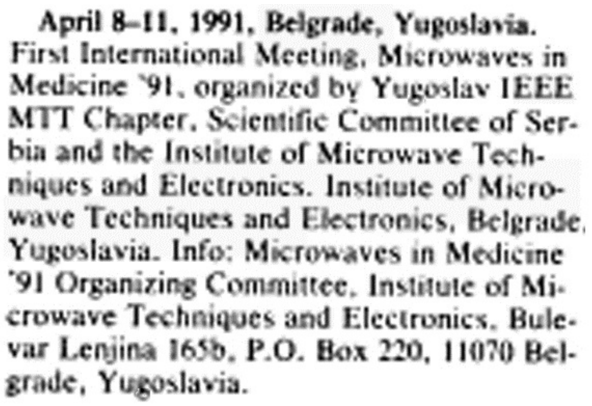
Ultrahigh Frequency Therapy of Duodenal Ulcers

M.Teppone, A.Vetkin, A.Kalin, A.Krotenko
Klin Med (Mosk). 1991 Oct;69(10):74-77 (Rus)

Microwaves in Treatment of Gastric Polyps

M.Teppone, A.Krotenko. A.Vetkin

Microwaves in Medicine 1991: International Scientific Meeting
April 8-11, 1991, Belgrad, Yugoslavia. p. 218-223

 **April 8–11, 1991, Belgrade, Yugoslavia.** First International Meeting, Microwaves in Medicine '91, organized by Yugoslav IEEE MTT Chapter, Scientific Committee of Serbia and the Institute of Microwave Techniques and Electronics. Institute of Microwave Techniques and Electronics, Belgrade, Yugoslavia. Info: Microwaves in Medicine '91 Organizing Committee, Institute of Microwave Techniques and Electronics, Bulevar Lenjina 165b, P.O. Box 220, 11070 Belgrade, Yugoslavia.	**April 8-11. 1991, Belgrade, Yuguslavia.** First International Sleeting, Microwaves in Medicine '91, organized by Yugoslav IEEE MTT Chapter, Scientific Committee of Serbia and the Institute of Microwave Techniques and Electronics, Institute of Microwave Techniques and Electronics, Belgrade, Yugoslavia. Info: Microwaves in Medicine '91 Organizing Committee. Institute of Microwave Techniques and Electronics. Bulevar Lenjina 165b. P.O. Box 220, 11070 Belgrade, Yugoslavia.

Meeting Calendar. – In: *Aviation, Space and Environmental Medicine*, 1991, 62(1): 280

=> **See**: # 86

Therapeutic Effect of Extremely High Frequency Puncture on Gastric Polyps

M.Teppone

American Journal of Acupuncture, 1991, 19 (1): 11-16
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Keywords: Acupuncture, gastric polyps, extremely high frequency (EHF)-puncture, traditional Chinese medicine, deqi.

Therapeutic Effect of EHF–Puncture on Gastric Polyps: Clinical Analysis of Eleven Cases

Michael Teppone
ul. Pyonerskay 8-92
Moskovskay obl. pos. Tomylino
U.S.S.R. 140070

Abstract: Extremely high frequency (EHF) puncture is a new therapeutic method, based on both the biological effects of low-power level millimetric electromagnetic waves and the acupuncture theory of Traditional Chinese Medicine, which can be used successfully in treating patients with gastric polyps. After 1-4 months of treatment, besides clinical improvement, it is possible to achieve disappearance or diminution of gastric polyps.

CURRENTLY in the Soviet Union extensive research is being conducted on the medical applications of low-power level (non-thermal) millimetric (MM) electromagnetic (EM) waves. The method of treatment is called Extremely High Frequency (EHF) Therapy. This method is effective in the treatment of patients of different diseases: gastric and duodenal ulcer, infantile paralysis, femoral aseptic necrosis, narcotism, cerebrovascular and broncho-obstructive diseases, different pain syndromes, etc.[1-3] It is used alone or as an adjunct to medicinal, x-ray, and/or psychotherapy, before and after surgery.

Special medical devices for EHF-therapy have been designed and built and include: Jav-1, Electronica-EHF, G4-142, etc.

Molecules of water and different hydrated structures of the skin (macromolecules, cell membranes) play a basic role in the absorption of MM-EM waves. An increase or decrease in hydration values of macromolecules leads to change in cell-membrane permeability, activity of the cell's c-AMP and so on. The final biological and medicinal effects are realized with the participation of nervous, cardiovascular, endocrine, immune, "acupuncture channel" and other systems of the living organism.[1-3]

There are different types of EHF-therapies which reflect different points of view on the mechanisms of this method of treatment. In accordance with one example, it is necessary to determine the "individual frequency" of MM-EM radiation inherent in each patient or for each disease. Another considers that it is necessary to individualize the site on the skin for EHF-radiation. The third individualizes both the frequency of MM radiation and the location.[1-3]

After using different types of EHF-therapy, we have concentrated on the use of EHF-*puncture,* which is a new method based on *both* the biological effects of low-power MM-EM waves and the acupuncture theory of Traditional Chinese Medicine (TCM). This paper discusses the application of this modality to the treatment of gastric polyps.

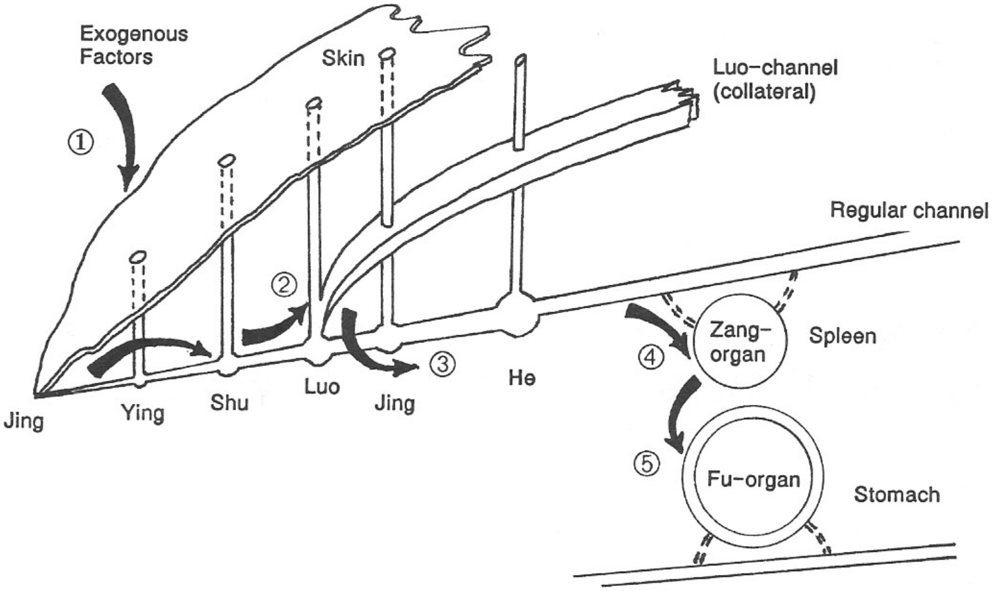
Exogenous Factors
①
Skin
Luo–channel (collateral)
Regular channel
②
③
④
⑤
Zang–organ
Spleen
Fu–organ
Stomach
Jing
Ying
Shu
Luo
Jing
He

Figure 1.
The pathogenesis of gastric polyps

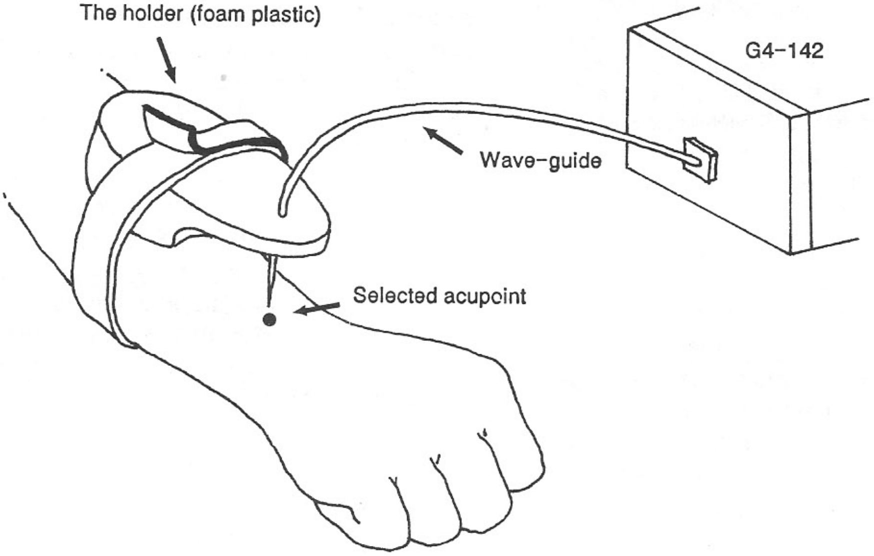
The holder (foam plastic)
G4–142
Wave–guide
Selected acupoint

Figure 2.
Wave-guide fixation

Gastric polyps (GP) most frequently occur in persons past middle age. The malignant transformation of GP continues to be a subject of considerable discussion.[4-6] Some researchers recommend that GP should be treated as precancerous lesions and resected surgically.[7,8] However, in certain cases, GP can disappear spontaneously.[9] Until now, there has not been any effective nonsurgical treatment method for GP.

Since March 1990 we have used EHF-puncture in the treatment of patients of GP with considerable success.

Materials and Methods

In our study group of 11 cases, there were 7 females and 4 males ranging in age from 44 to 63. The duration of the disease was 6 months to 4 years (on the basis of gastroscopic evidence of GP).

Most of the patients had fullness and distension in the epigastrium and abdomen, loss of appetite, nausea, heaviness of the body, loose stools, a bitter taste with a yellow or white-yellow, sticky tongue coating, and soft pulse. We considered these clinical manifestations as indications of Damp Heat in Stomach and Spleen.[10,11] In some of the patients the chief complaints were considered to be Deficiency or Excess of the Luo channel of the Spleen.[11]

Gastroscopic examination showed that 7 patients had single polyps, 4 patients had three or more polyps; the largest was 2.5cm in diameter. Polyps were distributed in different parts of the stomach, and these patients had chronic superficial or chronic atrophic gastritis. The histological diagnoses were adenomatous or hyperplastic polyps.

Treatment: The treatment points were selected in accordance with the indicated syndrome according to TCM. We used TCM diagnostic techniques of inspection, auscultation, olfaction, inquiring and palpation. Considering the clinical manifestations and anamnesis of the disease, we suggest that the pathogenesis of GP was as follows:

The Exogenous factors (EF) affecting Fu-organs pass through several stages: 1) Skin→2) Luo-channel of Zang organ (stage of Excess of Luo-channel of Zang-organ), →3) Meridians (the stage of Deficiency of Luo-channel of Zang-organ),→4) Zang-organ (initial stage of polyp formation),→5) Fu-organ (the stage when the polyp has been established in the Fu-organ). (See Figure 1)

During treatment we attempted to halt the entrance of additional Exogenous factors and to disperse the EF present in Zang and Fu Organs.

For fullness and distension in the epigastrium and abdomen, indicating a Deficiency of the Luo-channel of the Spleen, we selected acupoints Sp-3 (Taibai) (reinforcing [tonifying]), and St-40 (Fenglong) (reducing [sedating]). Later, when the distension and fullness disappear, some patients experience a recurrence of epigastric pain, associated in TCM with an Excess of the Luo-channel of the Spleen. At this stage we used Sp-4 (Gongsun) (reducing), and the pain disappeared.

To treat the Spleen Deficiency, we tonified Sp-2 (Dadu) and BL-20 (Pishu). The selection of other points depended on the type of EF: Heat, Cold or Damp. In all cases we took into consideration symptoms which defined the conditions of other Zang- and Fu-organs.

The treatment acupoints were radiated in consecutive order: at the beginning of the procedure, points which needed reinforcing were radiated first, then the points that needed reducing.

The same strategy can be used while treating polyps of different Fu-organs, e.g., Gallbladder, Large Intestine (nasal polyps).

An EM radiation generator, the "G4-142" was used. (Manufactured in Vilnius, USSR for nonmedical purposes, it radiates sinusoidal electromagnetic waves within the range of 53.0-78.0 GHz; the highest possible energy output is about 30 mw).

The treatment regimen was as follows: frequency = 53.53 GHz, i.e., wavelength equaled 5.6 mm, power did not exceed 0.1 mw. The needleless dielectric waveguide was fixed at the acupoints selected (see Figure 2). The duration of the radiation upon the acupoints depended on the type of effect the point required. For the reinforcing method, it was not more than 2-5 minutes, and it was necessary to wait until the first specific sensations appeared. For the reducing method, usually, the radiation duration was about 20-25 minutes and it was necessary to wait until specific sensations appeared and then disappeared.

We call attention to the "specific sensations" which had some interesting features. In accordance with TCM theory, the effect of treatment depends on a specific sensation, Deqi (Teh Chi), which patients experience during treatment, e.g., acupuncture, moxibustion, and qigong. There are different types of Deqi: The first one involves sensations at the acupoint itself. In this case it is possible to determine changes in the physical parameters (temperature, electric resistance, etc.) of the skin surrounding the acupoint. The second type of Deqi is a "propagated sensation along channels." In this instance, changes in physical parameters can be determined at the acupoints *along* the channel which is enriched with propagated sensations.[12] The third type of Deqi involves Whole Channel or Zang- and Fu-organs and is detectable as changes of both the skin at the acupoint and/or in the organ's function, e.g., heart beat.

Deficiency syndrome of the Spleen is defined as "heaviness in the body." When EHF is applied at Sp-2 on such patients, within 30 seconds to 2 minutes they begin to sense a "lightness in the body," "rocking" or even "flight." When patients with Stomach Heat syndrome receive EHF at St-44 (Neitang) or St-36 (Zusanli) with the reducing method, they begin to sense a "cooling of the abdomen," or "increasing quantity of saliva in the mouth." Some patients have different "visual sensations" (with eyes closed), for example, a "change of colors," "appearance of light" or even more complex visual shapes.

For GP patients the most common sensation was described as a "movement of little bubbles in the abdomen" (the middle part of the Sanjiao: Stomach-Spleen) or "propagated sensations along the channels."

Treatment was given once or twice per week. A course of treatment lasted 1-4 months.

Results

After treatment the chief symptoms disappeared in 7 cases and decreased in 4 cases. Gastroscopic examination showed that the therapeutic effects were as follows: 4 cases (36.4%) with disappearance of one or more polyps, 3 cases (27.3%) with reduction of polyp diameter by more than half of their original size; 3 cases (27.3%) with reduction of polyp diameter by more than one third of the original size; and only one case (9.0%) with no obvious change in size. (This patient did not experience any "sensations" (deqi) during the treatment).

In the control group of 10 gastric polyp patients receiving no treatment, there were no cases that showed endoscopic improvement during the 5-6 months of this study.

Conclusion

In spite of the fact that not all theoretical problems of the EHF-therapy are yet solved, this study indicates that this new method can be effective in treating gastric polyps.

We suspect that results can be further improved by the addition of the herbs and diet of Traditional Chinese Medicine.

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Therapeutic Effect of «EHF-Puncture» on Gastric polyps: a clinical analysis of 10 cases

M.Teppone, A. Krotenko.

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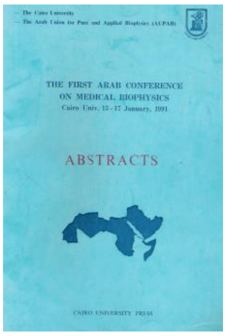

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ABSTRACTS

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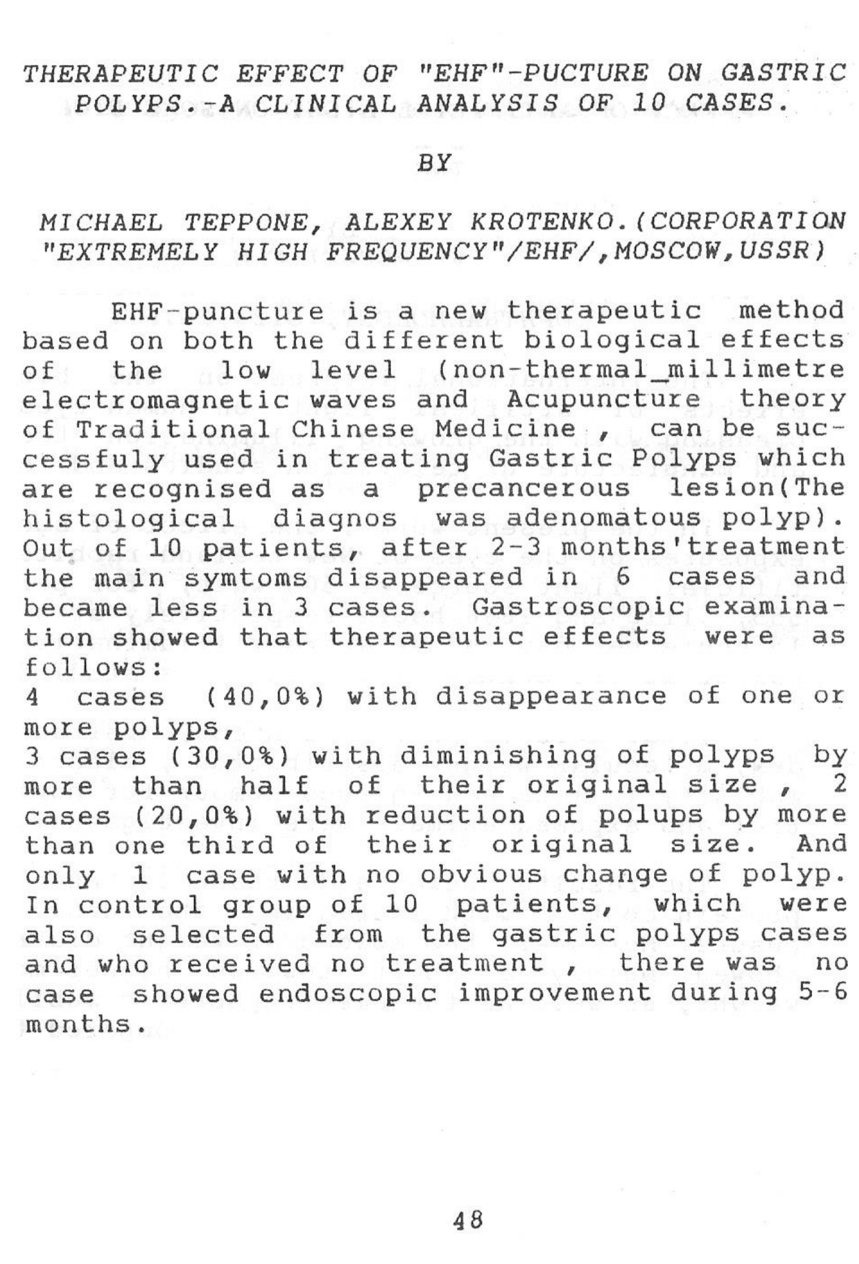

THERAPEUTIC EFFECT OF "EHF"-PUCTURE ON GASTRIC POLYPS.-A CLINICAL ANALYSIS OF 10 CASES.

BY

MICHAEL TEPPONE, ALEXEY KROTENKO.(CORPORATION "EXTREMELY HIGH FREQUENCY"/EHF/,MOSCOW,USSR)

EHF-puncture is a new therapeutic method based on both the different biological effects of the low level (non-thermal_millimetre electromagnetic waves and Acupuncture theory of Traditional Chinese Medicine , can be successfuly used in treating Gastric Polyps which are recognised as a precancerous lesion(The histological diagnos was adenomatous polyp). Out of 10 patients, after 2-3 months'treatment the main symtoms disappeared in 6 cases and became less in 3 cases. Gastroscopic examination showed that therapeutic effects were as follows:
4 cases (40,0%) with disappearance of one or more polyps,
3 cases (30,0%) with diminishing of polyps by more than half of their original size , 2 cases (20,0%) with reduction of polups by more than one third of their original size. And only 1 case with no obvious change of polyp. In control group of 10 patients, which were also selected from the gastric polyps cases and who received no treatment , there was no case showed endoscopic improvement during 5-6 months.

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Теппоне М.В.
Щеглов В.С.

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Способ определения частоты для проведения резонансной микроволновой терапии.

Изобретение относится к медицине и может быть использовано для подбора индивидуальной лечебной частоты внешнего электромагнитного излучения /ЭМИ/ при проведении резонансной микроволновой терапии /МВТ/.

Согласно работам Андреева Е.А. и соавт./I,2/,для повышения эффективности МВТ необходим индивидуальный подбор частоты ЭМИ. Там же описаны следующие способы подбора частоты:

-Способ,основанный на предполагаемом наличии сенсорного отклика у пациента при воздействии на него ЭМИ миллиметрового диапазона.При этом подбираются те частоты,при воздействии которых,появляются наиболее комфортные ощущения,предпочтительно,в области проекции больного органа.Недостатком этого метода является его субъективность,отсутствие сенсорного отклика у некоторых пациентов, трудность соотнесения некоторых видов сенсорного отклика с каким-либо органом.

-Способы,основанные на приборной регистрации изменения функции различных органов и систем.С этой целью используются стандартные методики: запись электрокардиографического сигнала /ЭКГ/,исследование электрической активности головного мозга,измерение артериального давления,миографические исследования и др.

Прототипом нашего изобретения является способ регистрации физиологического отклика организма на воздействие ЭМИ переменной частоты миллиметрового диапазона,основанный на анализе ритмики кардиоциклов [I,2]. Этот способ не имеет существенного приемущества перед другими вышеперечисленными способами приборной регистрации физиологического отклика организма на воздействие ЭМИ. Исследование проводится в положежении лёжа, в условии относительного комфорта. По стандартной методике ведется запись ЭКГ, определяется средняя частота сердечных сокращений за одну минуту. ЭМИ миллиметрового диапазона, излучаемое соответствующим генератором /Г4-I42/ посредством волновода передаётся в область ТА /точка акупунктуры/, так как выявлено, что зоны максимальной чувствительности к ЭМИ миллиметрового диапазона совпадают с классическими ТА [I,2]. При этом используются ТА общего действия или ТА традиционно применяемые при данном заболевании. Диапазон частот ЭМИ от 45 до 65 ГГц при плотности потока мощности не превышающем I0 мВт/см^2. Изменение частот осуществляется в ручном или автоматическом режиме. Резонансной или лечебной частотой считается та, воздействие которой сопровождается изменением частоты сердечных сокращений на I0-I5 в одну минуту. [I,2].

Недостатком данного способа является то, что не каждый отклик организма на воздействие ЭМИ сопровождается достоверным изменением частоты сердечных сокращений. Аналогичными недостатками обладают любые из вышеперечисленных способов регистрации физиологического отклика организма. Применяя эти способы подбора лечебной частоты у пациентов, страдающих заболеванием различных органов и систем, необходимо каждый раз использовать специальную методику наблюдения за изменением функции именно больного органа, а следовательно, поиск частоты затрудняется в связи со сложностью динамического наблюдения работы таких органов как тонкий кишечник, поджелудочная железа, суставы и др., для некоторых органов не разработан эффективный метод приборного динамического наблюдения изменения их функции.

Целью изобретения является обеспечение возможности наблюдения физиологического отклика различных органов и систем при проведении подбора лечебной частоты ЭМИ для МВТ у пациентов, страдающих заболеванием как органов, для которых существуют методы приборной регистрации изменения их функции, так и тех органов, наблюдение за которыми затруднено или до настоящего времени не разработано.

Цель достигается путем проведения динамической контактной термометрии в ТА каналов тела, имеющих связь с соответствующими органами и системами [I5,2I,22,28,30,3I], при одновременном воздействии ЭМИ, изменяемой частоты, на ТА.

Хотя в настоящее время проводятся тепловизионные наблюдения за ТА и каналами [4,5,6,7,II,I2,23] ,в ряде работ указывается на ограниченные возможности современных тепловизоров при оценке состояния ТА [8,9,I8]. Из методов контактной термометрии [3,I3,I4,26] нами был выбран метод,основанный на изменении сопротивления точечного германиевого диода,работающего в режиме обратного смещения, при изменение его температуры.

Наш прибор,аналогичный описанному в работе Богач П.Г.[3] ,состоит из термодатчиков /точечные германиевые диоды Д 9Г/,тумблера для переключения термодатчиков и подключения их к цифровому вольтметру /В7-2I/ и источника питания /элемент типа "Корунд" с номинальным напряжением 9,0 В/.Количество термодатчиков может варьировать в широких пределах,от I-2 до I2-24, в зависимости от количества ТА,взятых для наблюдения.При оценке динамики температуры в ТА нет необходимости переводить показания вольтметра,выраженные в милливольтах /мВ/,в градусы температуры.Достаточно знать,что в исследуемом интервале температур увеличение показаний вольтметра на I00 мВ соответствует снижению температуры,примерно,на I градус.Соответственно,при уменьшении показаний вольтметра,отмечается повышение температуры.Для динамического контроля температуры могут быть использованы автоматизированные системы наблюдения биофизических параметров ТА [I4,I5,20] .

Методика проведения подбора лечебной частоты для проведения МВТ:

-Во время процедуры пациент находится в положении лёжа.Рядом не должно быть согревающих и охлаждающих приборов.Термодатчики фиксируются лейкопластырем в области обследуемых ТА.Точки выбираются на каналах,связанных с функцией больного органа.Например,при язвенной болезни I2 перстной кишки и желудка используются ТА каналов Желудка /E/,Селезенки /PR/ и Печени /F/.Заболевание тазобедренного сустава сопровождается нарушением в каналах Мочевого и Желчного Пузыря 29 .На канале наиболее информативными считаются точки "Пособники"[I6,I7],которые можно сочетать с точками "Тревоги" [27]. Можно использовать точки с температурной асимметрией или точки в области больного органа.Не исключаются и другие варианты наблюдаемых точек.Для уменьшения охлаждающего влияния движения воздуха, области тела с фиксированными термодатчиками закрываются простынью. Через I5-20 минут после подготовки пациента начинается подбор лечебной частоты ЭМИ.Источником ЭМИ миллиметрового диапазона служит соответствующий генератор,в частности Г4-I42.Используется диапазон частот от 53,5 до 65-70 ГГц,хотя,возможно расширение диапазона. Плотность потока мощности не превышает I0 мВт/см^2.Облучению подвергаетс зона,соответствующая ТА,размером 0,3-I,0 см в диаметре. Используется ТА общего действия или традиционно применяемая при данном заболевании 29 .Переключение частоты осуществляется в ручном или автоматическом режиме.с шагом 0,02-0,I ГГц.После каждого переключения частоты ведётся наблюдение изменения показаний вольтметра в течении 0,5-I,0 мин. При поиске индивидуальной частоты,ЭМИ выбираются те частоты,воздействие которых уменьшает или устраняет имевшиеся температурные нарушения,а именно,уменьшает температурную асимметрию,температурный градиент в соседних ТА и т.д.Желательно, чтобы направленность действия найденной частоты было зафиксировано не менее 2-3 раз.

Приведем конкретный пример проведения процедуры:
Пациент Я-й I936 г.р.,страдающий правосторонним коксатрозом и асептическим некрозом головки правой бедренной кости,весной I987 года прошёл курс МВТ с хорошим клиническим эффектом.При повторном обращении ему проведено исследование по вышеописанной методике.Термодатчики были зафиксированны в области ТА каналов Желчного и Мочевого Пузыря /39VB- -точка "Пособник" канала Желчного Пузыря, 64V- точка "Пособник"канала Мочевого Пузыря, 29 и 30 V -точки в области проекции правого тазобедренного сустава/.Участки тела с термодатчиками закрыты простынью.В течении I5 минут до начала исследования пациент находился в положении лёжа.Использовался генератор Г4-I42.ЭМИ через волновод подводилось к ТА общего действия- Цзу Сан Ли,являющейся 36-й точкой канала Желудка.Плотность потока мощности не превышала 5-6 мВт/см^2.Смена частот осуществлялась в ручном режиме.Переключение происходило в следующей последовательности: 5720 - 5740 - 5750 - -5760 - 5730 - 5830 ГГц.Изменения показаний вольтметра до переключения на частоту 5730 ГГц соответствовало фоновым колебаниям температуры кожной поверхности пациента.При установке частоты 5730 ГГц отмечалось быстрое уменьшение показаний вольтметра с термодатчиков, фиксированных в точках наблюдаемых каналов,в частности в точке 64V слева с 365 мВ до 2I3 мВ, а в точке 30VB справа с 265 мВ до I37 мВ. Это соответствует повышению температуры в этих точках на величину равную примерно I,5°C за время наблюдения 2 мин.,хотя динамика показаний вольтметра была достаточно быстрой уже через 0,5 мин.Переключение частоты на произвольновыбранную 5830 ГГц сопровождалось возвращением показаний вольтметра,а соответственно и температуры к значениям,близким к исходным,в точке 64V слева с 239 мВ на 7I мин. исследования до 348 мВ на 72 минуте,а в точке 30VB справа с I34 мВ до I83 мВ соответственно.На этой частоте был проведен курс лечений с хорошим клиническим эффектом. /Рис. I/

Заявляемый нами способ определения частоты ЭМИ для проведения МВТ позволяет проводить изучение механизма действия электромагнитного излучения миллимтерового диапазона низкой интенсивности на организм человека.При этом необходимо пользоваться уже известной частотой ЭМИ.В случае с пацментом Я-м мы имели возможность наблюдать неравноценность ТА при воздействии одной частоты /Рис. I/.Отмечалось отсутствие температурной динамики,отличающейся от фоновых колебаний при воздействии на ТА: Хэ Гу -4-я точка канала Толстого Кишечника, Ней Гуань -6-я точка канала Перикарда /справа/,описаное выше повышение температуры на I,5 °С в ТА каналов Мочевого и Желчного Пузыря отмечалось лишь при воздействии ЭМИ частотой 5730 ГГц на 36-ю точку канала Желудка -Цзу Сан Ли- справа.

В работе Андреева Е.А. и соавт. [2] описан "Феномен Руденко",заключающийся в блокаде сенсорного отклика,при проведении МВТ,постоянным магнитным полем,действующим в зоне проекции канала,на который осуществляется воздействие ЭМИ.В нашем исследовании у пациента,страдающего язвенной болезнью I2 перстной кишки ЭМИ подавалось на 36-ю точку канала Желудка справа,плотность потока мощности при этом не превышала I мВт/см^2.При воздействии произвольной частотой 5920 ГГц не отмечалось колебаний температуры,в наблюдаемой точке"тревоги" канала Желудка, превышающих фоновые.При переключении на лечебную частоту 5730 ГГц отмечалось быстрое снижение температуры в этой точке,показания вольтметра с 408 мВ на 22-й мин. увеличились до 693 мВ на 23-й мин.,что соответствует уменьшению температуры на величину близкую к 3°С.В дальнейшем,на 35 минуте исследования,в области 35-й точки канала Желудка лейкопластырем фиксируется небольшой по размерам /I см в диаметре/ постоянный магнит,имеющий напряженность магнитного поля 500 Э.Начиная с 37-й минуты отмечается изменение показаний вольтметра,с термодатчика,фиксированного в точке "Тревоги" канала Желудка -Чжун Вань,лежащей на переднем срединном канале / 12Jm /в эпигастральной области:С 652 мВ на 37-й мин. до 394 мВ на 38 мин.,таким образом отмечалось возвращение как показаний вольтметра,так и соответственно температуры к величинам близким к исходным. /Рис. 2/Одновременно с возвращением температуры к исходной отмечался интересный сенсорный отклик,описываемый пациентом как"быстрое падение вниз головой".

Таким образом,заявляемый нами способ подбора частоты ЭМИ для проведения МВТ за счет контроля динамики температуры в ТА каналов, позволяет определять частоту ЭМИ как для органов,для которых существуют удобные методы приборной регистрации изменения их функции, так и для органов,наблюдение за изменением функции которых затруднено или не разработано до настоящего времени.

Кроме того, заявляемый нами способ позволяет изучать механизм действия ЭМИ миллиметрового диапазона на организм человека как при изолированном применении, так и в сочетании с действием других факторов, как например постоянное магнитное поле и др., при условии использования уже известной частоты электромагнитного излучения, оказывающей определенное влияние на температуру в исследуемых ТА.

Формула изобретения.

I. Способ определения частоты для проведения резонансной микроволновой терапии, заключающийся в воздействии ЭМИ миллиметрового диапазона перестраиваемой частоты и регистрации отклика организма на воздействие, отличающийся тем, что с целью повышения достоверности и объективности, а также для обеспечения наблюдения отклика органов динамическое наблюдение изменения функции которых затруднено или не разработано, регистрируют изменение температуры в точках акупунктуры каналов, связанных с исследуемым органом и по резкому отклонению температуры от фонового значения судят об искомой частоте.

2. Способ по п.I отличается тем, что исследование проводят после выдержки пациента в течении I5-20 минут в условиях ограниченного теплообмена с окружающей средой, например путем закрытия зон с фиксированными термодатчиками простынью.

3. Способ по п.I,2 отличается тем, что используется диапазон частот ЭМИ 53,5-70 ГГц.

4. Способ по п.I,2,3 отличается тем, что время воздействия ЭМИ миллиметрового диапазона заданной частоты устанавливают не менее 0,5-I,0 минуты при плотности потока мощности не превышающем I0 мВт/см^2.

5. Способ по п.I-4 отличается тем, что зона, облучаемая ЭМИ миллиметрового диапазона устанавливается в пределах 0,3-I,0 см в диаметре.

6. Способ по п.I-5 отличается тем, что при использовании уже известной по действию частоты ЭМИ, можно проводить изучение механизма действия ЭМИ миллиметрового диапазона на организм человека как в условиях изолированного применения ЭМИ, так и в сочетании с другими внешними факторами, в частности, в сочетании с постоянным магнитным полем.

Ведущий инженер-патентовед /Травина Т.А./
ВНК "КВЧ"

Авторы: /Теппоне М.В./
/Щеглов В.С./

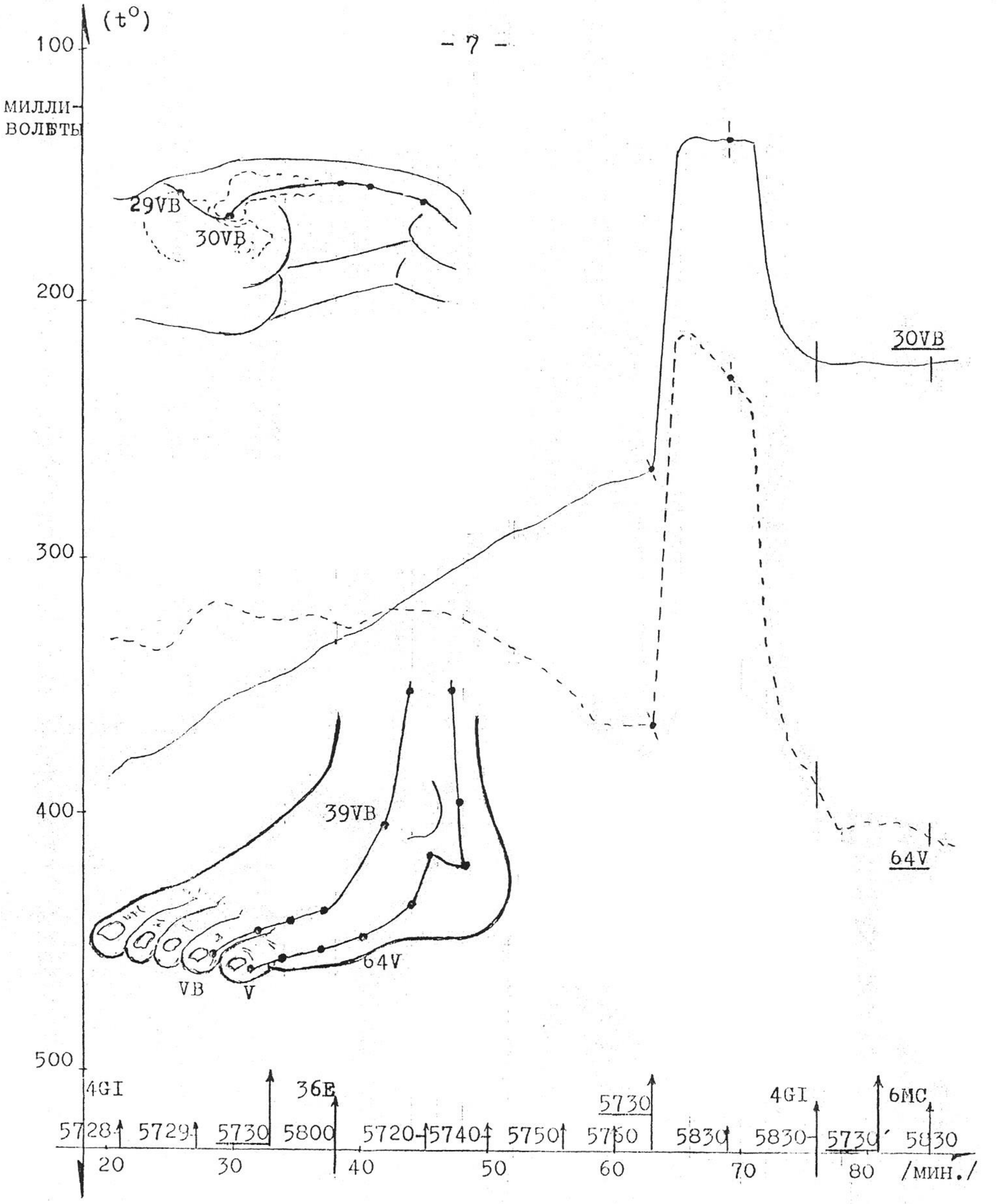

Рис. I

Пациент Я-й В.Г.,1936.г.р.
Дз:Правосторонний коксартроз...
Лечебная частота **ЭМИ** - 5730 ГГЦ
Точки воздействия:36Е,4GI,6МС/Пр
Точки контроля динамики температуры: -локальные в области правого тазобедренного сустава-29VB 30VB ,точка "Пособник" канала Мочевого-64V и Желчного Пузыря-39VB

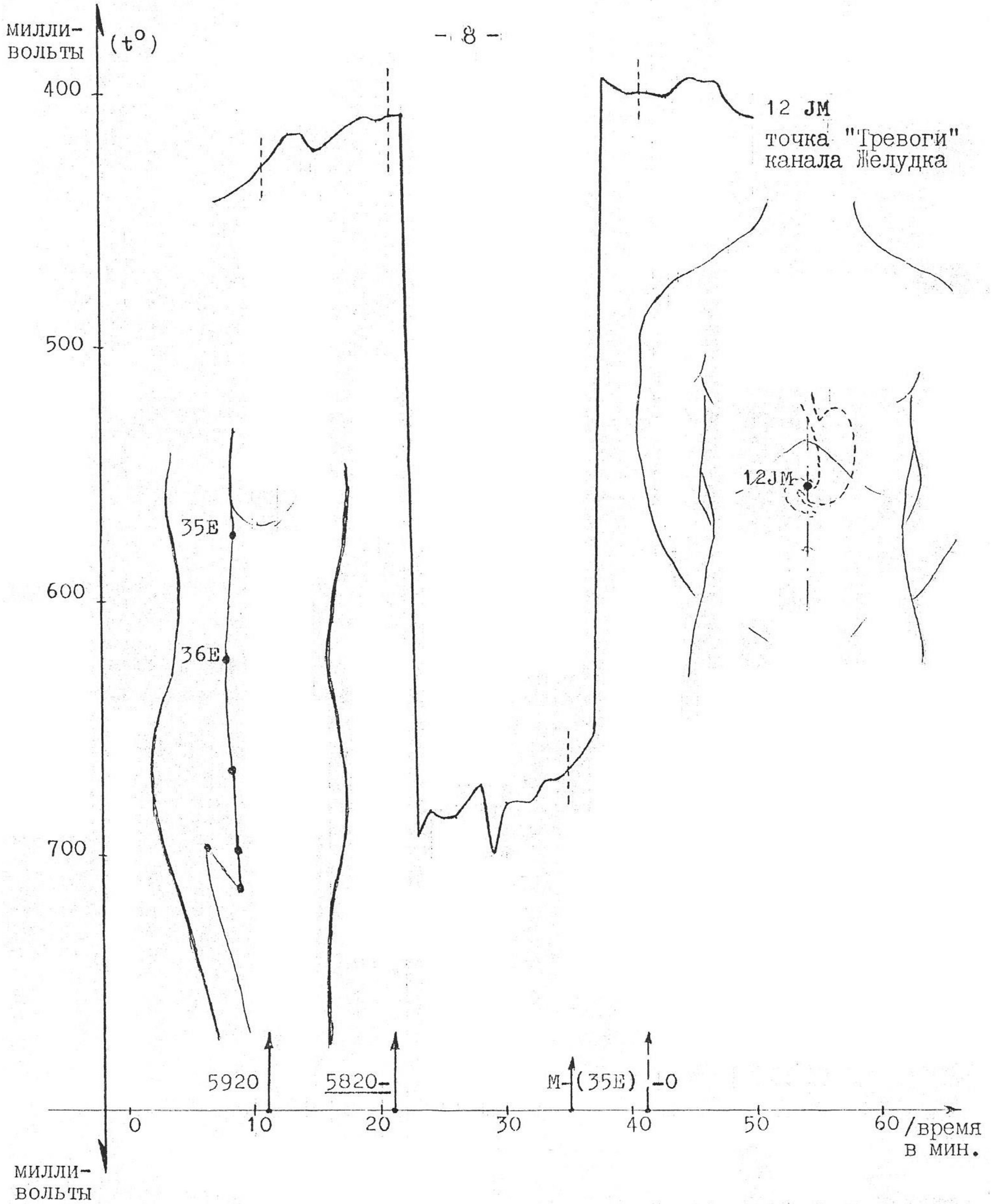

Рис. 2

Пациент Ф-в В.А. 1944 г.р.
Дз:Язвенная болезнь 12 п.к.
Лечебная частота ЭМИ- 5820
/ГГЦ/
Точка воздействия - 36E/Пр/
Магнит в точке 35E/Пр/
Генератор выключен на 41 мин

Использованная литература.

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Анализ литературных данных, посвященных КВЧ-терапии, и собственные наблюдения

М. Теппоне

Москва - 1989

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Введение

Несмотря на широкое внедрение КВЧ-терапии в клиническую практику многие вопросы применения этого метода(лечения)остаются неразрешенными, что значительно снижает эффективность лечения. Перед врачем встает ряд вопросов, касающихся оптимизации режима КВЧ-терапии.

На основании тщательного анализа и систематизации литературных данных и собственных наблюдений,предпринята попытка найти точки соприкосновения между древней системой традиционной китайской медицины и относительно новым фактором воздействия, которым является КВЧ-излучение.

Имеющиеся сокращения:

-ЭМИ- электромагнитное излучение,
-ММ диапазона- миллиметрового диапазона,
-КВЧ- крайне высокие частоты,
-ТА- точка акупунктуры.

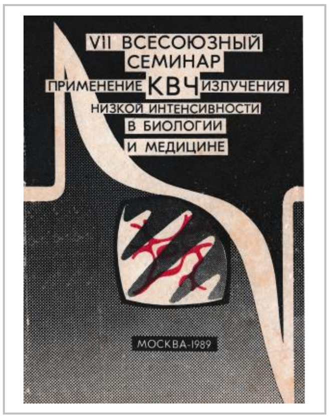
See: https://archive.org/details/1989-teppone

I. Лечебное применение миллиметрового излучения низкой интенсивности в биологии и медицине.

I.0 Краткая история.

Согласно литературным данным проблемой изучения влияния электромагнитного излучения миллиметрового диапазона низкой интенсивности начали заниматься в нашей стране с середины 60-х годов двадцатого столетия. Группу советских ученых возглавлял Н.Д.Девятков. С 1964 по 1982 год пройден этап от первых исследований до клинических экспериментов. В настоящее время ЭМИ[*] ММ[**] диапазона все более широко используется в клинической практике для лечения различных заболеваний.

В работах В.Н.Волченко и соавторов [1987,1989] на основании проведенных экспериментов делаются выводы о возможности взаимодействия между собой сенсорно разобщенных биологических объектов /человек/ непосредственно с помощью электромагнитных волн в диапазоне от 2,5 до 0,3 мм, причем взаимодействие осуществляется через кожную поверхность тела и проявляется наиболее эффективно в полосах поглощения излучения Солнца атмосферой с максимумами вблизи 2,5; I,7; 0,9; 0,77; 0,4 мм, где земные организмы адаптированы к исключительно низкому уровню естественного электромагнитного фона. Источником ЭМИ ММ диапазона служили руки оператора. В 1986 г. опубликован ряд работ по изучению "пранотерапии". Истоником "праны" или "жизненной энергии" также служили руки человека. Воздействие рук на личинки Tenebrio Molitor приводило к значительно более раннему наступлению окукливания экспериментальных образцов по сравнению с контролем. [Donna A. 1986] Изучалось влияние "праны" на препараты поперечно-полосатых мышц и кожи с последующим гистологическим исследованием. Было выявлено, что исследуемые ткани похожи на препараты, получаемые из египетских мумий. [Rabino Massa E.,Reddavid M. 1986]. Аналогичным образом исследовалась печеночная ткань кролика, забитого и затем "обрабатываемого" "праной" по 30 минут ежедневно в течение I5 дней, причем, как экспериментальный труп животного



Способ оптимизации КВЧ терапии

М. Теппоне, В. Щеглов, А. Симакова

VII Всесоюзный семинар: Применение КВЧ-излучения
низкой интенсивности в биологии и медицине
13-15 ноября, Звенигород, тезисы, М.: 1989, с.118
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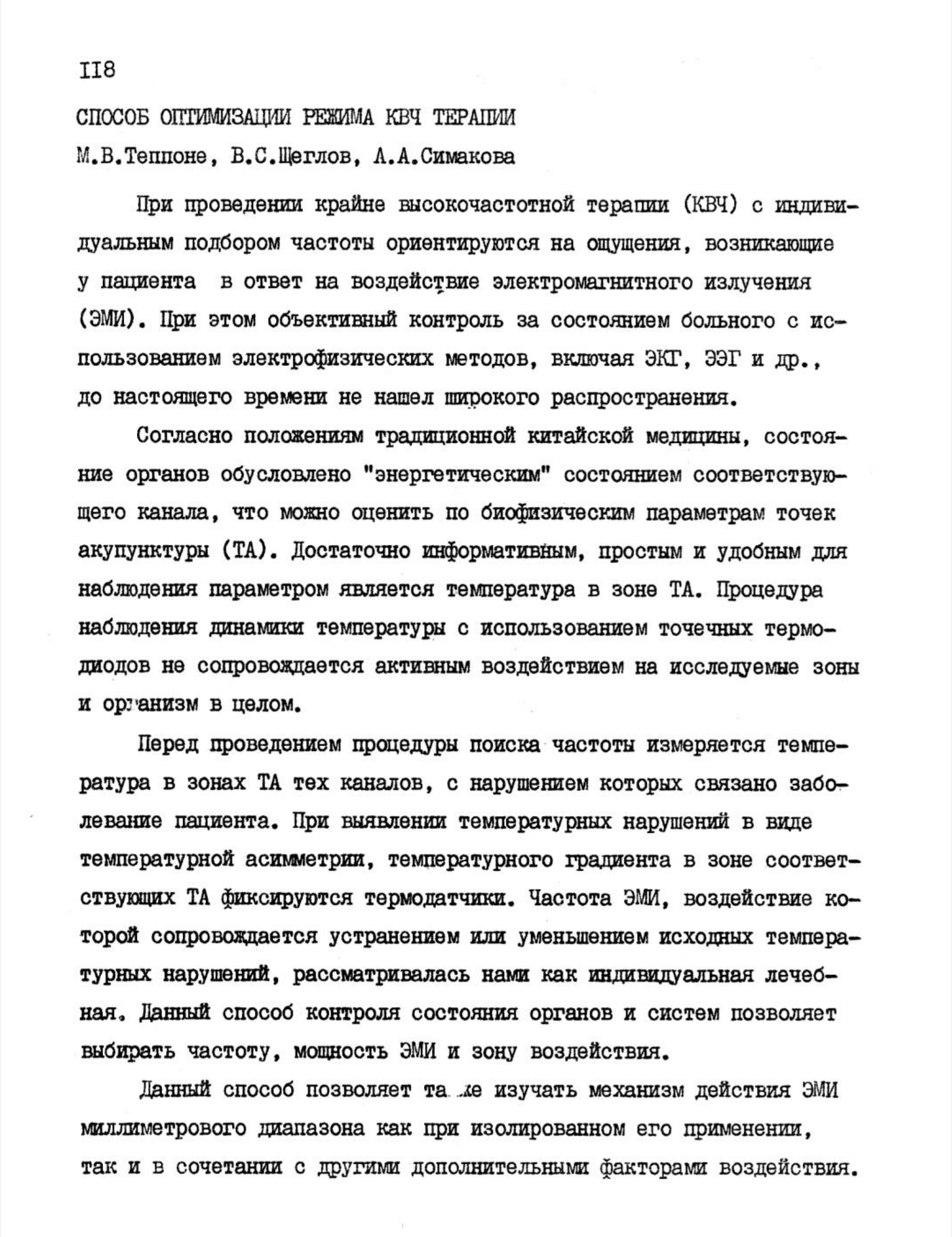

СПОСОБ ОПТИМИЗАЦИИ РЕЖИМА КВЧ ТЕРАПИИ

М.В.Теппоне, В.С.Щеглов, А.А.Симакова

При проведении крайне высокочастотной терапии (КВЧ) с индивидуальным подбором частоты ориентируются на ощущения, возникающие у пациента в ответ на воздействие электромагнитного излучения (ЭМИ). При этом объективный контроль за состоянием больного с использованием электрофизических методов, включая ЭКГ, ЭЭГ и др., до настоящего времени не нашел широкого распространения.

Согласно положениям традиционной китайской медицины, состояние органов обусловлено "энергетическим" состоянием соответствующего канала, что можно оценить по биофизическим параметрам точек акупунктуры (ТА). Достаточно информативным, простым и удобным для наблюдения параметром является температура в зоне ТА. Процедура наблюдения динамики температуры с использованием точечных термодиодов не сопровождается активным воздействием на исследуемые зоны и организм в целом.

Перед проведением процедуры поиска частоты измеряется температура в зонах ТА тех каналов, с нарушением которых связано заболевание пациента. При выявлении температурных нарушений в виде температурной асимметрии, температурного градиента в зоне соответствующих ТА фиксируются термодатчики. Частота ЭМИ, воздействие которой сопровождается устранением или уменьшением исходных температурных нарушений, рассматривалась нами как индивидуальная лечебная. Данный способ контроля состояния органов и систем позволяет выбирать частоту, мощность ЭМИ и зону воздействия.

Данный способ позволяет также изучать механизм действия ЭМИ миллиметрового диапазона как при изолированном его применении, так и в сочетании с другими дополнительными факторами воздействия.

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Original Article

Application of Cell Extracts from Skin, Placenta, Mesenchyme with Collagen and Elastin in Aesthetic Dermatology and Skin Revitalization: Evaluation of Outcomes in Cohort Study

Dmitry Klokol[1]*, Dina Tulina[1], Mikhail Teppone[1], Mike Chan[1], Michelle Wong[1], Henry Pong[2], Maria Del Mar Cabarbas[3] and Wladimir Chernykh[4]

[1]Stellar Biomolecular Research, Germany
[2]Stem Cell research Laboratory, University of Hong Kong, China
[3]Aesthetic Dermatology and Anti-aging Center, Cali, Colombia
[4]Centre of Laser and Aesthetic Dermatology, Kiev, UA

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Address for Correspondence
Stellar Biomolecular Research
UG, An der Welle 4, 60322
Frankfurt am Main, Germany
E-mail:
dr.dmytro@sbi-europe.com

ABSTRACT

Aging–related changes of the skin are characterized by reduction of the elasticity, moistness and thickness, appearance of wrinkles, pigmented spots, lentigos, and keratosis. Histological changes include thinning of epidermis, flattening of epidermal-dermal interface, reduction of production and disorganization of collagen and elastin, slowdown of cell turnover, reduction of melanocytes and their erratic activity and the phenomenon of solar elastosis.

The objectives of the study were to evaluate the efficacy of mesotherapy with a cocktail containing combination of cell extracts from skin, placenta and mesenchyme with addition of collagen and elastin proteins in rejuvenation and revitalization of the facial skin.

The cohort comprised of 26 women in the age 40-65 y.o. (mean age 56 ± 2.5) with Fitzpatrick skin types III and IV and Glogau score II-III. Treatment consisted of mesotherapy applied on the forehead, cheeks, periorbital and perioral areas, chin and neck. The injected formulation was MF+ Mito Organelles™ SPMCE – peptide-extracts from *skin*, *placenta*, *mesenchyme*, with *collagen* and *elastin.* Treatment sessions were performed across 12 weeks at weekly intervals.

Final results were assessed 1 and 3 months after the last mesotherapy session using photographic comparison and patient's subjective view and external dermatologist-expert's opinion, clinical and instrumental evaluation, and histopathology report.

Clinical and histochemical data obtained from the study confirms the anti-aging properties of the used product. Analysis of dermal elastic filaments has proven the reduction of skins roughness and determined the bio-revitalizing and rejuvenating effect of the used product. Study has demonstrated MF+ MO™ SPMCE capacity to promote biosynthesis of new collagen and elastic fibers. The improvements in skin hydration and dramatic reduction of senile lentigo and uneven pigmentation were noted.

Obtained data allow to conclude that application of MF+ MO™ SPMCE cellular extracts/peptides in mesotherapy can be considered as safe and effective method of facial rejuvenation.

Keywords: Mesotherapy, Rejuvenation, Facial revitalization, Cell extracts, Anti-aging.

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Case Report Open Access

Management of Metastatic Colorectal Carcinoma with GcMAF Forte and Thymus Peptides: A Case Report

Dmitry Klokol* **and Mikhail Teppone**

Stellar Biomolecular Research, Germany

***Corresponding author:** Dmitry Klokol, Stellar Biomolecular Research, Germany, Tel: +60169687977; E-mail: dr.dmytro@sbi-europe.com

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Abstract

In the recent years immunotherapy has gained important role in cancer management. Immunostimulating effects of thymus-derived peptides on carcinogenesis have been actively studied in both animals and humans. Gc protein derived macrophage-activating factor (GcMAF) was found to have potent effect on macrophage phagocytic activity. Immunostimulating effects of GcMAF and peptides of thymus can be effectively combined together and with other treatment modalities of cancer. The current case report demonstrates outcomes of combination of GcMAF Forte and HT Thymus (peptides of thymus) in the management of metastatic colorectal adenocarcinoma. This case study suggests that individually prescribed immunotherapy can be a promising alternative in management of advance forms of cancer, especially when options of treatment are limited.

Keywords: Colorectal cancer; GcMAF; Thymus peptides; Immunotherapy; Metastatic cancer

Introduction

Liver is the most common site of metastasizing of colorectal cancer. Secondaries in liver are found in 25-35% of patients going for surgery of primary colorectal tumors [1]. Simultaneous removal of solitary metastatic liver nodules during the primary operation is widely performed by surgeons all around the world for the last 50 years and has become a golden standard. According to the National Cancer Institute's SEER database the 5-year survival rate for stage IV colorectal cancer is 11-12%. In case of recurrence of liver metastasis after the single-stage surgical removal of primary tumor and secondary liver nodule, patients with resectable disease have median survival 14-20 months, and patients with unresectable disease have median survival 4-12 months. In spite of existing chemotherapeutic regimens 5-year surviving rate is only 0-2% [2].

In recent years immunotherapy is gaining popularity in treatment of advanced form of cancer due to its minimal toxicity and outstanding safety compared to conventional chemotherapy. Researchers are studying effects of thymus-derived peptides on carcinogenesis of various forms of cancer. Thymus peptides have a very high potential to regulate its functional activity by stimulating the development and maturation of functional T-cells in the central medulla of thymus. The matured functional T-cells enter the circulation and provide adequate adaptive immune system response [3].

Apart from T-cells, macrophages also play a vital role in anticancer immunity. Macrophages provide phagocytosis of cancer cells, release TNF (tumor necrosis factor) and other cytokines that cause tumor cytolysis, induce apoptosis of tumor cells, reduce neoangiogenesis in the tumor site, and induce proliferation and activation of other immunocompetent cells. The research of Dr. Nobuto Yamamoto has discovered the role of Gc protein-derived macrophage-activating factor (GcMAF) in increasing phagocytic activity of macrophages, significant anticancer effects, and antineoangeogenesis effect [4].

So far we did not come across publications on application of GcMAF and thymus peptides in management of colorectal cancers. The case presented below appeared interesting to us as there is an insufficient data on efficacy of such approach to treatment of advanced forms of cancer.

Case Report

A 34-year old patient was diagnosed with sigmoid adenocarcinoma in June 2013. In August 2013 patient underwent sigmoid colectomy in one of the private medical centers during which a solitary subcentimeter liver nodule was noted and removed. Histopathological report of the surgical specimen concluded moderately differentiated adenocarcinoma (T3N1M1). Histopathology report confirmed that liver nodule was consistent with primary lesion. All margins were clear. Four out of the 15 regional lymph nodes were positive for adenocarcinoma. Post-operative period was uneventful and patient recovered well. Patient received first-line adjuvant chemotherapy with FOLFOX regime (Oxaliplatin plus 5-fluoruracil and leucovorin). Patient was under follow up by surgeon and oncologist. Six months after the completion of FOLFOX regime the serum CEA level start elevating. Repeated CT scan of thorax, abdomen and pelvis showed presence of secondary lesions in the right lobe of liver as well as aorto-caval lymphadenopathy. Otherwise no evidence of local recurrence, or chest lesions was found. Patient was not agreeable for any invasive treatment, i.e. ablation therapy, hepatic arterial infusions or surgical intervention, however, agreed for second line chemotherapy. FOLFIRI regime was given (Irinitecan plus folic acid, 5-flouoracil, and leucovorin). Although patient experienced some side-effects of chemotherapy, such as diarrhea, fatigue and lowering of blood counts, six cycles of chemotherapy were completed. Restaging PET-scans after second line chemotherapy showed avid liver lesions. Patient refused for any further treatment and even defaulted follow up for the next 10 months. Subsequently, when returned for the follow up patient presented with pain in the right hypochondrial region with a palpable mass in that area, fatigue, loss of appetite, deranged liver function test due to increased levels of transaminases, gamma-glutamyltransferase

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Full Length Research Paper

Efficacy of renal precursor stem cells in management of chronic kidney disease: a cohort study

Mike Chan[1], Michelle Wong[2], Mikhail Teppone[1] and Dmitry Klokol[1]*

[1]Stellar Biomolecular Research, Germany.
[2]Frontier Cytobiological Therapies International, EU.

*Corresponding author. E-mail: Dr.dmytro@sbi-europe.com

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In spite of tremendous achievements of modern medical science, chronic kidney disease (CKD) is still considered to be an untreatable pathology. CKD is caused by various etiological factors and is characterized by progressive deterioration of renal function due to loss of functioning nephrons. In absence of definitive treatment, CKD imposes a threat of end-stage renal failure with further necessity of dialysis and kidney transplant. In this article, we present a combined data on application of stem cell therapy in patients with CKD stages 3a and 3b. The influence of precursor cell implantation on parameters of renal profile is studied in a group of 23 patients with CKD stage 3a and 3b. Results of stem cell implantation were evaluated 6 months and 1 year after the procedure. 78.5% of patients with CKD stage 3a had improvement of their serum creatinine level and GFR. In the group of patients with CKD stage 3b, 66.7% had improvement of parameters of renal function test and downstaging of CKD. Fetal precursor cell application in management of CKD is a promising therapeutic modality and requires further detailed analysis and continued clinical trials.

Key words: Kidney, renal failure, precursor stem cell, xenotransplantation, kidney repair.

INTRODUCTION

Chronic kidney disease (CKD) is characterized by progressive deterioration of renal function due to loss of functioning nephrons. The main causes of CKD are hypertension, diabetes mellitus, nephrolithiasis, recurrent infections of urinary tract, various autoimmune disorders, etc. In spite of tremendous achievements of modern medical science, CKD is still considered as irreversible, gradually worsening condition that ultimately results in end-stage renal failure (ESRF), which subsequently dooms patients for regular hemodialysis and kidney transplant. Hemodialysis is associated with high morbidity rate, high cost of the procedure and life-long post-operative management and follow-up (El Nahas and Bello, 2005).

Such situation urges to seek for new advanced therapeutic modalities that are able to restore renal function or at least significantly slow down the progression of CKD. Recent research and studies has shown that the most promising opportunity to restore nephron functionality is stem cell therapy (Hopkins et al., 2009; Benigni et al., 2010; Gilbert et al., 2012; Li and Wingert, 2013).

Adult human kidney is comprised of hundreds of thousands to nearly one million of nephrons. It contains different types of cells including glomerular podocytes, tubular epithelial cells, endothelial cells, pericytes, interstitial fibroblasts, and dendritic cells (Martin and Parkhurst, 2004; Romagnani, 2011; Romagnani et al., 2013). During lifetime, various kidney cells exhibit different turnover; however in overall, the cell turnover in kidney is remarkably lower than in other organs (Ronconi et al., 2009a, b; Smeets et al., 2013; Liu, 2011).

As a result to acute and chronic damages, such as inflammation, ischemia, autoimmune processes kidney launchedvarious mechanisms of regeneration, including compensatory renal hypertrophy, cell proliferation, reprogramming of endogenous renal cell, renal progenitor cell differentiation, mesangial cell proliferation and

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Full Length Research Paper

Efficacy of the MFIII placenta extracts softgels supplementation: a randomized double-blind placebo-controlled study

Mike Chan, Michelle Wong, Alain Béguin, Mikhail Teppone, Dina Tukhvatullina, Dmitry Klokol*

Stellar Biomolecular Innovations (Germany, Hong Kong, Malaysia), Skin Testing Institute, (Switzerland)

*Corresponding author email: dr.dmytro@sbi-europe.com

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ABSTRACT

Placenta consumption (placentophagy) is a widely encountered phenomenon in animal kingdom and also is accepted in certain communities as one of the means to increase mother’s energy, stimulate milk production, balance the hormonal level, reduce postpartum depression and insomnia, and achieve anti-aging effect. Cosmetic industry has successfully developed various products based on animal placenta. In this article we study efficacy of MFIII Placenta Extract supplementation in cosmetology. The following parameters are studied: skin surface roughness, skin elasticity and firming effect, skin radiance, regenerative improvement of epidermis+dermis density, skin hydration-moisturization, skin surface sebum level, melanin index, erythema index, transepidermal water loss.

Keywords: placenta extracts, placenta supplements, rejuvenation, revitalization, cosmetology supplements.

INTRODUCTION

In all times and cultures people tried to find effective ways of rejuvenation and revitalization by creating products based on the organic source able to strengthen the inner power and resources of human body, improve stamina and fitness, and invigorate the skin. In animal kingdom placenta consumption is a normal widely encountered phenomenon and even human placentophagy is accepted in certain communities as one of the means to increase mother’s energy, stimulate milk production, balance the hormonal level, reduce postpartum depression and insomnia, achieve anti-aging effect, etc (Coyle et al., 2015).

Cosmetic industry has successfully developed various products based on animal placenta. However most of it vary in quality and are lacking of scientific substantiation.

It is the responsibility of the cosmetic industry to provide the consumer with safe products they can trust in, which meet their requirements. Regulatory authorities request a number of conditions to be met, should a cosmetic product be put on the market. Particularly, product claims must be vindicated, as far as this is compatible with the constitution and quality of the product and with the claim praised. Proof of the claims is considered to be an additional safety factor for consumers and regulatory authorities. Furthermore, tests in human beings are increasingly encouraged for cosmetic products and their ingredients, and especially for finished products, instead of animal tests (Phillip and

Canadian Interdisciplinary Network for
Complementary & Alternative Medicine Research
IN-CAM
Réseau interdisciplinaire canadien de recherche
sur les médecines alternatives et complémentaires

IN-CAM Mini-Symposium
CAM Research:
From Experience to Evidence
February 2, 2007 - Montreal, Quebec

Extremely High Frequency (EHF) − Puncture is a non-invasive, painless and effective approach in acupuncture

R.Avakyan, M.Teppone

IN CAM Mini-Symposium. From Experience to Evidence, Montreal, Quebec, February 2, 2007 (Poster)
https://archive.org/details/avakian-ehf-puncture-in-cam

Extremely High Frequency (EHF) Therapy represents a new treatment method based on various biological effects produced in the living organisms by low-intensity electromagnetic radiation in the millimetre (MM) waveband. [One of the first researches concerned with biological effects of MM band has been done in Canada (S.Webb et al., 1968; 1969)]. It is well established today that exposed acupoints or skin zones, rather than radiation frequency, play an essential role in the treatment efficiency.

High sensitivity of acupoints to MM radiation has been revealed and it is probably explained by high hydration of the skin at these areas. Algorithm approach of the acupoints selection has efficiently developed in traditional Chinese medicine (TCM). Based on the patient's complaints and anamnesis of disease, appearance and tongue inspection, a syndrome TCM diagnosis is determined, which allows to select treatment points and methods. Millimetre-wave radiation may be used in treatment of "Excess" and "Deficiency" type of diseases. Modality of the effect is determined by the acupoints exposure time.

The most important peculiarity of MM waves is their possibility to stimulate specific sensory reactions (phenomenon De Qi) not only at the place of exposed acupoints but at the place of Qi-disorders directly.

Besides, this needle-free acupuncture is non-invasive and painless: millimetre waves are transmitted to selected acupoints by means of a special dielectric waveguide.

Thus, EHF-puncture based on syndrome approach of the traditional Chinese medicine, represents a relatively new and efficient method for treatment of various diseases, including those whose aetiology and pathogenesis are unknown, while nosologic diagnosis is difficult to determine and treatment methods are undeveloped.

ЧЕТВЕРТЫЙ МЕЖДУНАРОДНЫЙ АЭРОКОСМИЧЕСКИЙ КОНГРЕСС
Посвящается 100-летию авиации
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18 – 23 августа 2003 г.
Москва, Россия

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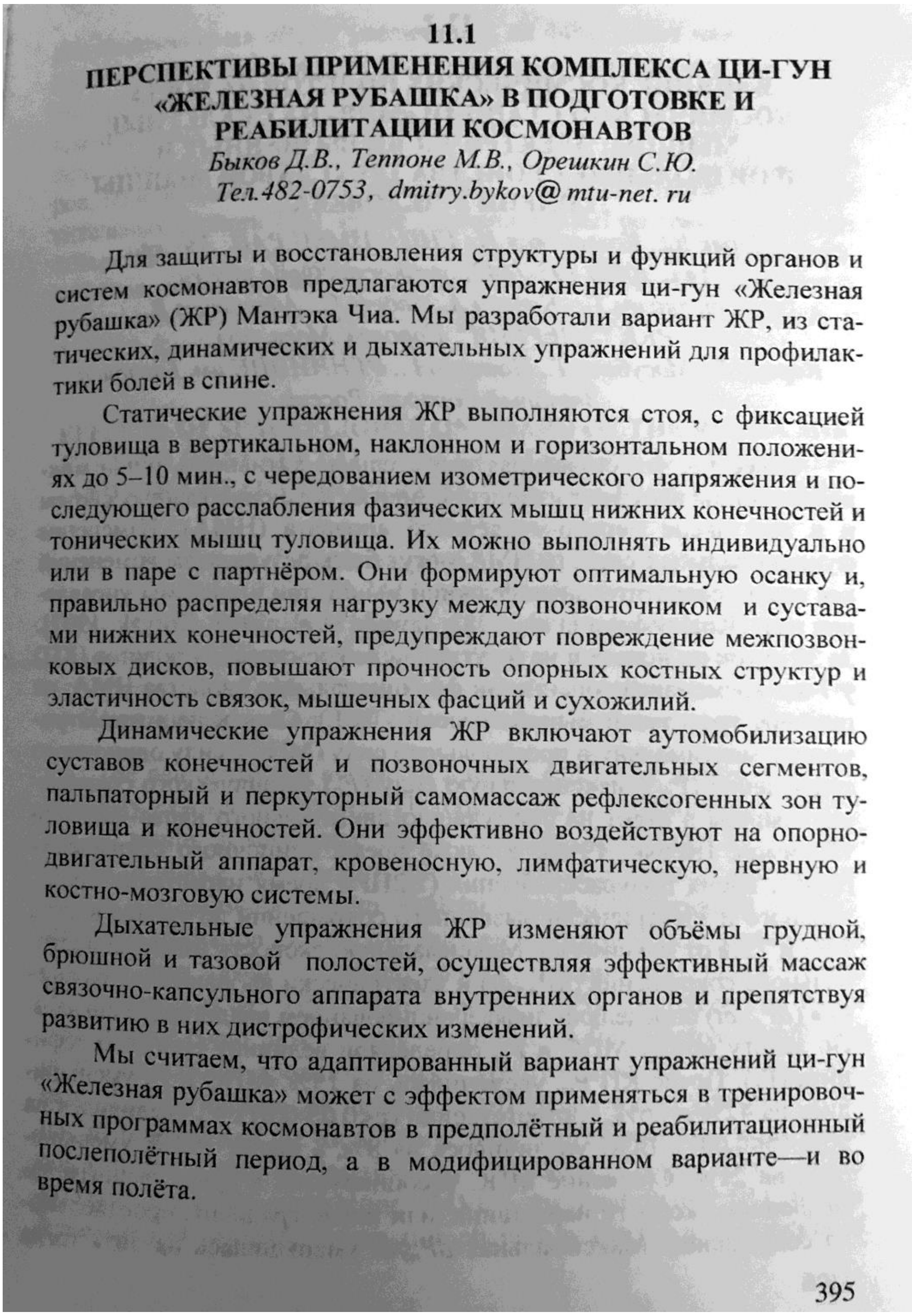
Abstracts
18 – 23 August, 2003
Moscow, Russia

Перспективы применения комплекса Ци-Гун «железная рубашка» в подготовке и реабилитации космонавтов

Д. Быков, М. Теппоне, С. Орешкин

IV Международный аэрокосмический конгресс.
18-23 августа 2003ж Москва, Россия (тезисы) с. 395
https://archive.org/details/bykov-qi-gong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ПЕРСПЕКТИВЫ ПРИМЕНЕНИЯ КОМПЛЕКСА ЦИ-ГУН «ЖЕЛЕЗНАЯ РУБАШКА» В ПОДГОТОВКЕ И РЕАБИЛИТАЦИИ КОСМОНАВТОВ

Быков Д.В., Теппоне М.В., Орешкин С.Ю.
Тел.482-0753, dmitry.bykov@ mtu-net. ru

Для защиты и восстановления структуры и функций органов и систем космонавтов предлагаются упражнения ци-гун «Железная рубашка» (ЖР) Мантэка Чиа. Мы разработали вариант ЖР, из статических, динамических и дыхательных упражнений для профилактики болей в спине.

Статические упражнения ЖР выполняются стоя, с фиксацией туловища в вертикальном, наклонном и горизонтальном положениях до 5–10 мин., с чередованием изометрического напряжения и последующего расслабления фазических мышц нижних конечностей и тонических мышц туловища. Их можно выполнять индивидуально или в паре с партнёром. Они формируют оптимальную осанку и, правильно распределяя нагрузку между позвоночником и суставами нижних конечностей, предупреждают повреждение межпозвонковых дисков, повышают прочность опорных костных структур и эластичность связок, мышечных фасций и сухожилий.

Динамические упражнения ЖР включают аутомобилизацию суставов конечностей и позвоночных двигательных сегментов, пальпаторный и перкуторный самомассаж рефлексогенных зон туловища и конечностей. Они эффективно воздействуют на опорно-двигательный аппарат, кровеносную, лимфатическую, нервную и костно-мозговую системы.

Дыхательные упражнения ЖР изменяют объёмы грудной, брюшной и тазовой полостей, осуществляя эффективный массаж связочно-капсульного аппарата внутренних органов и препятствуя развитию в них дистрофических изменений.

Мы считаем, что адаптированный вариант упражнений ци-гун «Железная рубашка» может с эффектом применяться в тренировочных программах космонавтов в предполётный и реабилитационный послеполётный период, а в модифицированном варианте—и во время полёта.

395

Визуализация диффузной и локальной электропроводимости кожи

Ромен Авакян, Михаил Теппоне

10-я Международная научно-практическая конференция по квантовой медицине.
Москва, 1-5 декабря, 2003 (сб. докл). с. 113-116
https://archive.org/details/diffuse-and-local-skin-conductivity

Кожа человека и животных характеризуется морфологической и функциональной неоднородностью. На языке традиционной китайской медицины (ТКМ) эта неоднородность описана как «кожные зоны», «точки акупунктуры», «каналы» и «коллатерали».

Электрическая неоднородность кожи сохраняется в течение нескольких дней после смерти.[4,5,19] Постепенно, за счет аутолитических процессов, происходящих в трупе, физические параметры кожи выравниваются, а электрическая неоднородность исчезает.

Поверхностный слой кожи называется эпидермисом, состоящим из многослойного плоского ороговевающего эпителия, в котором постоянно происходит обновление и специфическая дифференцировка клеток – кератинизация. Под эпидермисом находится дерма, включающая сосочковый слой, образованный рыхлой волокнистой соединительной тканью, и сетчатый слой, образованный плотной неоформленной соединительной тканью. В большинстве участков кожи человека в ее сетчатом слое располагаются потовые и сальные железы, а также корни волос. Пучки коллагеновых волокон из сетчатого слоя дермы продолжаются в слое подкожной клетчатки, сформированной, в основном, жировой тканью (рис. 1/б).

Электропроводимость кожи определяется ее толщиной, наличием дериватов и содержанием воды, а также функциональным состояния различных органов и организма в целом. Изменения проводимости можно наблюдать на произвольно выбранных (стандартных) участках кожи или на участках кожи, известных как точки акупунктуры (ТА).[14,24,25,28]

Точки акупунктуры. Основу точки акупунктуры формирует рыхлая соединительная ткань с «вкраплением» большого количества нервных рецепторов и свободных нервных окончаний, развитой сосудистой системой, клеточными элементами, содержащими биологически активные вещества, и скопление щелевых соединений.[2,11] (рис. 1/а).

Электрическое сопротивление кожи, в среднем, колеблется около 1-2 МОм, а в области выхода ТА оно снижается до 20-60 КОм.[12,13,18,26]

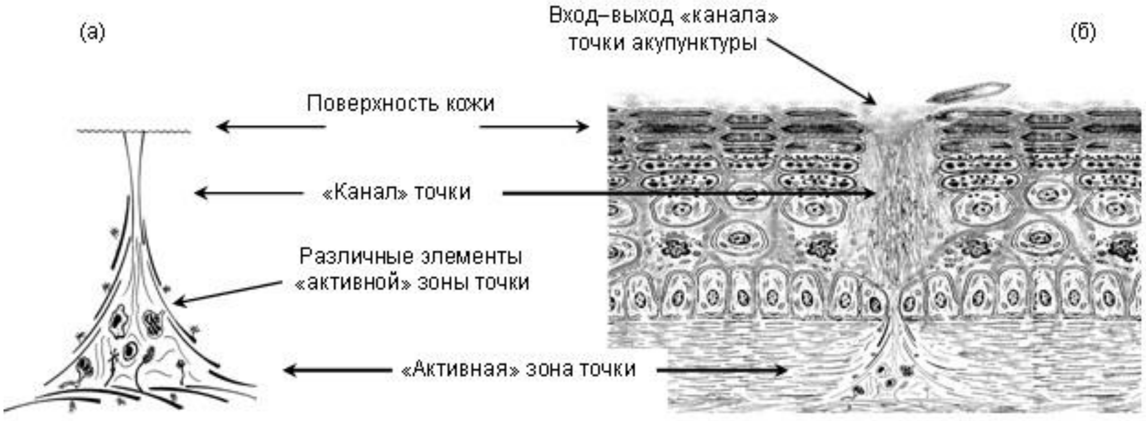
(а)
Вход–выход «канала» точки акупунктуры
(б)
Поверхность кожи
«Канал» точки
Различные элементы «активной» зоны точки
«Активная» зона точки

Рисунок 2. Схема строения точки акупунктуры (а)
и схема расположения точки акупунктуры в коже (б).

Каналы и коллатерали. Согласно теории ТКМ в организме человека и животных Ци («энергия») и кровь циркулируют по определенным путям, называемым каналами и коллатералями (рис. 2).

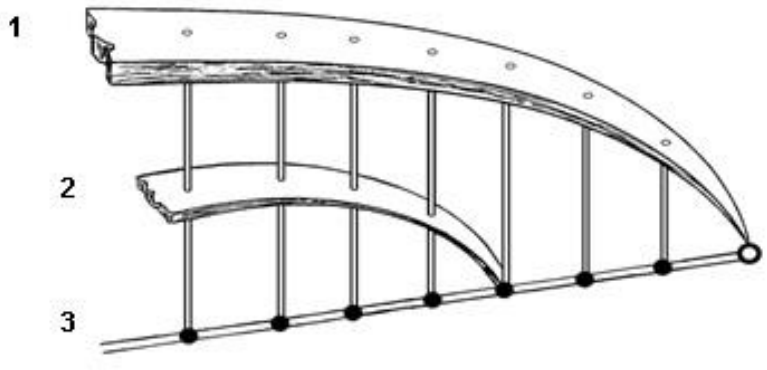

Рисунок 2. Схема строения каналов и коллатералей:
1) Сухожильно-мышечный канал,
2) Ло-продольный канал,
3) Главный канал с точками.

Предполагается, что «каналы» являются самостоятельной и наиболее древней (в филогенетическом и онтогенетическом смысле) регулирующей системой организма.[5,15,29] Морфологическая и функциональная простота обусловливает проблемы ее верификации, поскольку канальная система «…слишком примитивна с точки зрения современной биологии…».[27] Но, являясь базовой, она объединяет между собой все остальные, более сложные и более молодые системы макроорганизма, а также обеспечивает взаимодействие внутренней среды организма с внешним окружением.[5,15,29]

Современный взгляд на теорию «каналов» позволяет рассматривать ее как описание физиологии и патологии межклеточного пространства. Таким образом, «каналы» можно представить как систему «щелей», протянувшихся между различными анатомическими образованьями. Поверхности отдельных мышц, сосудов, нервов, костей и других структур формируют «наружные стенки», так называемых «каналов». Эти «щели» заполнены продольно ориентированной волокнистой соединительной тканью, основным веществом, растворами электролитов и структурированной водой.[16] Вероятно, передача высокочастотных сигналов, генерируемых клеточными мембранами, реализуется по «щелевым» или волноводоподобным структурам, что подтверждается рядом экспериментальных работ.[7,10]

Согласно рефлекторной теории, между кожей и внутренними органами существуют взаимосвязи, известные как кожно-висцеральные и висцеро-кожные рефлексы. Теория функциональных систем описывает более сложные механизмы взаимодействия между различными звеньями рефлекторных дуг.[1] Кроме того, взаимосвязь между органами и тканями тела реализуется посредством различных биологически активных веществ, клеточных элементов, продуктов метаболизма, электрических сигналов и т. д.

В исследованиях биофизических параметров кожи выделяют диффузную и локальную электрическую проводимость.

Визуализация диффузной проводимости. Диффузная проводимость кожи, обусловлена проводящими свойствами межклеточных промежутков кожного эпителия. В теории ТКМ она отражает состояние «защитной энергии» или Wei Qi. Этот вид проводимости зависит от влажности кожи и, соответственно, активности потовых желез.

При развитии заболевания «снаружи» формируется так называемый синдром полноты сухожильно-мышечного канала или кожной рефлексогенной зоны. Этот синдром характеризуется основными признаками острого воспаления, т.е. имеет место гиперемия, гипертермия, гиперестезия, отек и нарушение функции соответствующей конечности. В случае прогрессирования внешнего заболеваний, формируется синдром пустоты сухожильно-мышечного канала или кожной рефлексогенной зоны. Этот синдром характеризуется признаками хронического воспаления и атрофии, т.е. имеет место бледность кожи, гипотермия, гипестезия, снижение тургора кожи и нарушение функции соответствующей конечности. Синдром полноты ТКМ соответствует гиперфункциональным рефлексогенным зонам, описанным Захарьиным и Гедом,[6,20]] а синдром пустоты ТКМ соответствует гипофункциональным рефлексогенным зонам, описанным Вильямовским.[3]

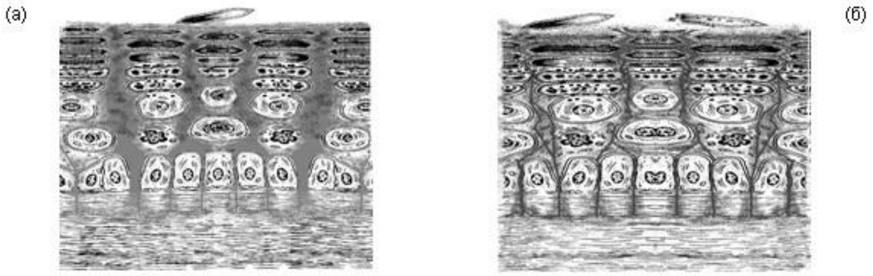

Рисунок 3. Расширение межклеточного пространства при синдроме «полноты» сухожильно-мышечного канала (а) и сужение – при синдроме «пустоты» (б).

Сопротивление клеточной мембраны достаточно велико (особенно в кератоцитах) и во много раз превышает проводимость в микрощелях, имеющихся между клетками. Поэтому, можно предполагать, что основной вклад в проводимость кожи (вне ТА) вносит проводимость межклеточных щелей. Сбалансированное взаимодействие между структурными и жидкостными компонентами дермы обеспечивает оптимальный уровень электрической проводимости. При синдроме полноты (воспаление в фазе альтерации и экссудации) имеет место отек, выделение медиаторов воспаления и усиление микроциркуляции, что сопровождается расширением межклеточных промежутков и снижением кожного сопротивления (рис. 3/а). При синдроме пустоты преобладают процессы атрофии, замещения нормальной ткани дермы соединительнотканными компонентами, происходит нарушение микроциркуляции и повышение кожного сопротивления (рис. 3/б).

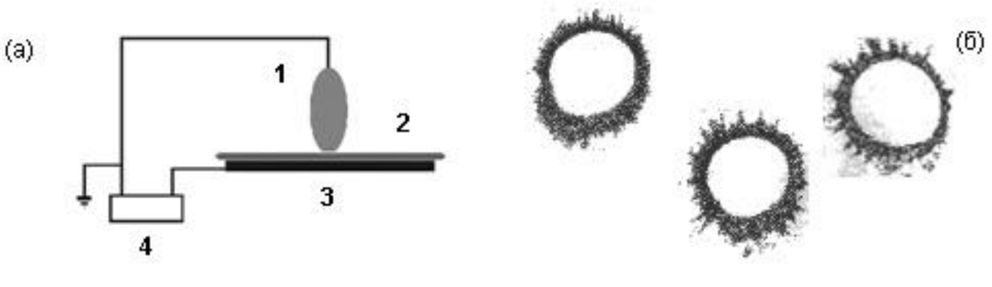

Рисунок 4. Принципиальная схема аппарата, реализующего эффект Кирлиана (а): и пример визуализации диффузной проводимости коньчиков пальцев (б).

1) Биологический объект (пальцы рук),
2) Диэлектрик,
3) Активный электрод,
4) Генератор.

Визуализация диффузной проводимости впервые была осуществлена супругами С.Кирлиан и В.Кирлиан.[8] В последующем, разработка аппаратуры, основанной на эффекте Кирлиана, велась различными авторами, включая В.Инюшина, К.Короткова, Lin Xianzhe и др. (рис. 4/а). В настоящее время в экспериментальной и клинической практике широко используется аппарат газоразрядной визуализации – «Corona - TV».[9]

Обычно для диагностических целей проводится исследование свечения, отражающее диффузную проводимость в области кончиков пальцев (рис. 4/б), а затем, с помощью программного обеспечения формируется виртуальная картина «ауры», окружающей человека.

Визуализация локальной проводимости. Локальная проводимость кожи, обусловлена проводящими свойствами тканей межклеточного пространства в области траектории главных каналов. В теории ТКМ она отражает состояние «питающей энергии» или Ying Qi. Предполагается, что при увеличении количества питающей энергии в главном канале происходит увеличение его проводимости. Одновременно увеличивается проводимость канала точки и кожи в области выхода канала на поверхность. (рис. 1/б)

Измерение локальной (точечной) проводимости обычно осуществляется контактным методом. При этом измеряемые группы ТА и величина тока варьируют у различных авторов.[[21,22,24,28]

Попытки визуализировать точки с минимальным электрическим сопротивлением предпринимались с середины 80-х годов прошлого века.[23] Современным вариантом метода визуализации точек наименьшего электрического сопротивления является аппарат «AcuVision».[3]

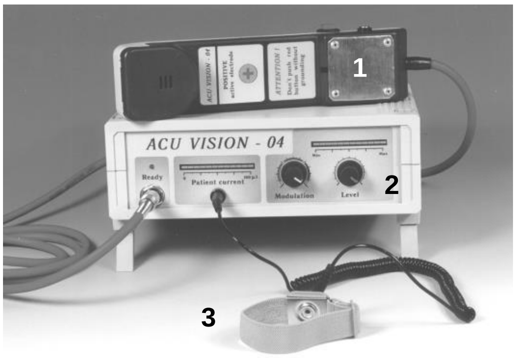

Рисунок 5. Основные блоки аппарата «*AcuVision*»:
1) Активный электрод,
2) Блок управления и питания,
3) Заземляющий электрод.

Для визуализации точек с локальным понижением сопротивления необходимо использовать относительно толстый диэлектрик (по сравнению с диэлектриком, используемым для визуализации диффузной проводимости), который значительно увеличивает суммарное сопротивление, складывающееся из сопротивления кожи и диэлектрика.

Над точечной зоной низкого электрического сопротивления кожи на диэлектрике возникает «пробой», где наблюдается наиболее высокая интенсивность коронного разряда. В этом же месте на диэлектрике формируется феномен люминесценции в виде яркого пятна (рис. 6).

После проведения процедуры визуализации точек наименьшего электрического сопротивления необходимо правильно оценить полученные результаты. Для предположительного анализа рекомендуется использовать следующие критерии: локализация ТА и их связь с определенными каналами и органами, а также яркость и длительность свечения. Рекомендации анализировать яркость (размер) и длительность свечения точек базируются на экспериментальных данных, показывающих, что размер проводящего участка кожи в области ТА зависит от уровня «энергии»: при феномене избытка размер проводящего «окна» увеличивается, а при недостатке энергии – уменьшается.[12,22] Одновременно с увеличение размера электропроводящего пятна, повышается проводимость «точки» и, соответственно, яркость и длительность свечения.

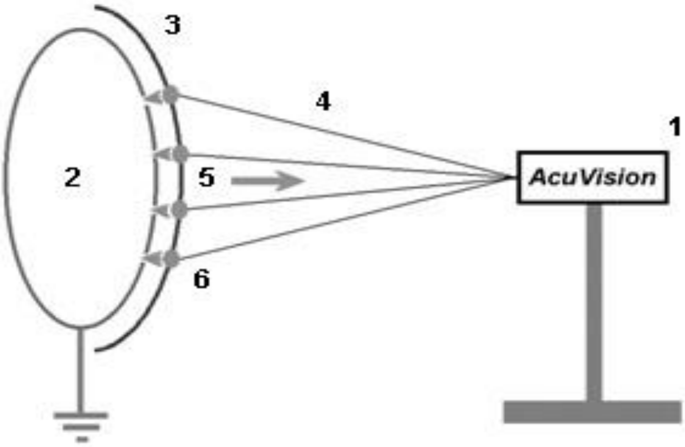

Рисунок 6. Физический принцип визуализации локальной проводимости кожи:
1) Активный электрод аппарата «AcuVision» (положительный),
2) Заземленный биологический объект (пациент),
3) Диэлектрик (полиэтилен, хлопчатобумажная ткань),
4) Силовые линии коронного разряда,
5) Направление движения отрицательных ионов и электронов,
6) Люминесценция на диэлектрике в местах повышенной проводимости.

В связи с тем, что аппарат визуализирует любые точки, имеющие пониженное сопротивление, то для идентификации этих точек необходимо использовать атласы канальных, внеканальных, новых и аурикулярных точек, а также точек, описанных докторами R.Voll, Park Jae Woo (Su Jok) и другими авторами.

Таким образом, в зависимости от состояния точек и каналов, происходит изменение электрического сопротивления и размера проводящего участка кожи в области выхода точки на поверхность тела.

Выявленные точки могут быть использованы как в диагностических, так и в лечебных целях. При этом на них можно оказывать тонизирующее (при пустоте) или тормозное (при полноте) воздействие с помощью игл, прижигания или различных методов аппаратного лечения: аэро-ионная терапия, электро-пунктура, лазеро-пунктура и КВЧ-терапия.

Помимо визуализации точек и зон наименьшего электрического сопротивления, аппарат «AcuVision» позволяет проводить аэроинную терапию и электропунктуру.[17]

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Возможности квантовой терапии в лечении онкологических заболеваний

М. Пильх, М. Теппоне

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г. Москва, МПК Медицинский центр Оракул
Пильх М.Д. - ГУЗ Московский областной онкологический диспансер
Теппоне М.В. - Федеральный научный клинико-экспериментальный центр
традиционных методов диагностики и лечения МЗ России; ООО «Колояро-2000»

С 1998 по 2003 гг проведено лечение 12 пациентов с местно-распространенными формами злокачественных новообразований с различными локализацией и морфологическими формами.

Все пациенты были обследованы в специализированных стационарах и имели диагноз, верифицированный гистологически и цитологически. Определение стадии заболевания осуществлялось с помощью компьютерной рентгеновской томографии, магниторезонансной томографии, стандартной и трехмерной ультразвуковой томографии, а также других диагностических методов, соответствующих стандартам, утвержденным МЗ РФ и г. Москвы (1999 г.)

В исследуемой группе было 4 мужчин и 8 женщин в возрасте от 35 до 67 лет. Локализации злокачественного процесса была следующей: легкие (n=3), желудок (n=3), молочные железы (n=4), прямая кишка (n=2).

Среди сопутствующих заболеваний выявлены: гипертоническая болезнь, ишемическая болезнь сердца, кардиосклероз, сердечно-легочная недостаточность и сахарный диабет в стадии компенсации.

К началу данного исследования больные получали лишь симптоматическую терапию. Специальные виды радикального лечения не проводились в связи с распространенностью онкологического процесса или в связи с отказом больных.

Все больные предъявляли жалобы, связанные с прогрессированием основного заболевания.

Помимо современного патофизиологического и патоморфологического анализа жалоб и симптомов заболевания, проводился дополнительный дифференциальный диагноз на основании синдромного подхода традиционной китайской медицины (ТКМ).

У больных чаще всего выявлялись (в разной степени выраженности) следующие синдромы :

1. *Пустота-холод желудка в сочетании с пустотой Ян* [бледность кожных покровов, холодные конечности, схваткообразные или постоянные боли в животе, анорексия, бледный язык с белым налетом, зябкость, учащенное мочеиспускание, светлая моча, редкий, тонкий и глубокий пульс,];
2. Сочетание синдрома *полноты желудка* (рвота, срыгивание после приема пищи, неприятный запах изо рта, облегчение состояния после рвоты, боли при пальпации в эпигастрии) и симптомов *пустоты Ян*;
3. *Пустота Инь легких* [сухой кашель, ощущение жара, усиливающегося во второй половине дня, румянец в области скул, потливость одышка частый пульс];
4. *Холод в легких* [отек и бледность лица, одышка до удушья, кашель с белой мокротой, зябкость, белый влажный язык, поверхностный и напряженный пульс];

5. *Жара-полнота толстого кишечника* [стул с примесью крови, иногда тенезмы, склонность к запорам, боли при дефекации, вздутие живота, язык с желтым налетом, сухость во рту, частый пульс];

Для объективизации синдромного диагноза ТКМ использовался метод Ryodoraku (измерение электрической проводимости 12-ти каналов) с помощью программно-аппаратного комплекса (ПАК) Антэл.

Лечение проводилось в соответствии с синдромным диагнозом ТКМ. Воздействие осуществлялось на точки акупунктуры.

В зависимости от преобладания симптомов «жара» или «холода» использовалась КВЧ-терапия [аппарат «Арцах-01» в режиме комбинированного излучения: плотность потока мощности когерентного излучения на частоте 60,00 ГГц не более 5 мВт/см^2, спектральная плотность мощности шумового излучение в диапазоне частот от 42,00 до 95,00 ГГц не менее 20 dB/kT$_0$; амплитудная модуляция по типу «волновых качелей» в диапазоне 1-99-1 Гц] или прогревания полынными сигарами соответственно. Некоторые пациенты получали сочетанную терапию вышеуказанными методами в комбинации с лекарственными препаратами ТКМ.

Классическая паллиативная терапия, а именно, лучевая терапия, химиотерапия, стероидные и наркотические анальгетики, иммуномодулирующие препараты, во время проводимого исследования не использовалась.

Эффективность лечения оценивалась с учетом субъективных критериев (самочувствие пациента, динамика жалоб, доза используемых анальгетиков) и показателей современных диагностических методов (размеры опухолей, склонность к инвазивному росту, уровень специфичных опухолевых маркеров и гормонов крови).

Время наблюдения за пациентами составляло от 6 до 36 месяцев. В течение первого месяца процедуры проводились 1-2 раза в неделю. В последующем, по мере стабилизации состояния больного, интервалы между процедурами увеличивались. Лечебные курсы длились 2-3 месяца, в зависимости от исходного состояния больного. Периодичность повторных курсов 2-4 раза в год. В отдельных случаях допускалось лечение на дому, проводимое родственниками больного с использования полынных сигар под наблюдением специалиста. Лечение и наблюдение прекращались по инициативе пациента и его родственников.

В большинстве случаев, во время лечебного курса прогрессирования заболевания отмечено не было. Лишь у 2-х пациентов отмечено незначительное увеличение линейного размера опухоли (не более 1-2 мм в год). У всех больных выявлено стойкое снижение уровня опухолевых маркеров крови.

Измерение электрической проводимости каналов с помощью ПАК «Антэл» позволило говорить о стабильности состояния пациентов или умеренной положительной динамике.

Качество жизни по субъективной оценке было удовлетворительным и соответствовало 60 - 70 % по шкале Карновского или 2 - 3 по классификации ВОЗ (Женева, ВОЗ 1992 г.: *Inernational Classification of Diseases and Related Health Problems*, Vol. 1, WHO, 10-th Revision). Все пациенты самостоятельно обслуживали себя, работали по дому, некоторые продолжали заниматься своей профессиональной деятельностью.

Заключение

Использование КВЧ-терапии и лекарственных препаратов ТКМ в сочетании с прогреванием акупунктурных точек полынными сигарами у пациентов со злокачественными новообразованиями различной локализации сопровождается стабилизацией основного процесса, улучшает качество жизни, а в некоторых случаях, способствует регрессу опухоли.

Желательно, чтобы лечение проводилось врачом-онкологом, имеющим достаточные знания по использованию ТКМ. Допустимо проведение лечения врачом-рефлексотерапевтом, понимающим принципы постановки диагноза ТКМ, в сотрудничестве с врачом-онкологом. В любом случае, при выработке тактики и показаний к этим видам лечения необходимо полное клиническое обследование и морфологическая верификация диагноза.

Для объективизации синдромного диагноза ТКМ и мониторирования лечебного процесса целесообразно использование ПАК Антэл.

Мы надеемся, что дальнейшие исследования в области применения вышеуказанных методов у больных с запущенными формами онкологических заболеваний позволят изучить механизмы, лежащие в основе противоопухолевого эффекта, а сами методы станут альтернативой для существующих классических методов лечения, связанных с высоким риском для жизни, или имеющих низкую противоопухолевую активность.

Possibility of Quantum Therapy of Oncology diseases

M.Pilkh, M.Teppone

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Современные технологии, используемые в традиционной восточной медицине

Р.Авакян, М.Теппоне, И.Карнеев, С.Эльмен

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1. Физиология межклеточного пространства

Кожа человека и животных характеризуется морфологической и функциональной неоднородностью.[1–3] На языке традиционной китайской медицины (ТКМ) эта неоднородность описана как «кожные зоны», «точки акупунктуры», «каналы» и «коллатерали».

Электрическая неоднородность кожи сохраняется в течение нескольких дней после смерти.[2,3] Постепенно, за счет аутолитических процессов, происходящих в клетках, физические параметры кожи выравниваются, и электрическая неоднородность исчезает.

Основу точки акупунктуры (ТА) формирует рыхлая соединительная ткань. В зоне ТА выявлены нервные рецепторы и свободные нервные окончания, сосуды микроциркуляторного русла, тучные и иммунные клетки, а также большое число «щелевых контактов», обеспечивающих информационные связи между клетками.[4–6]

Таким образом, точка акупунктуры представляет собой сложную функциональную единицу, обеспечивающую взаимосвязь между внешней и внутренней средой человеческого организма.

Согласно теории ТКМ в организме человека и животных Qi («энергия») и кровь циркулируют по определенным путям, называемым каналами. Что понимается под термином «канал» или «меридиан»?

Некоторые авторы считают, что это воображаемая линия, связывающая между собой функционально близкие точки. При этом реальная связь между ТА осуществляется на различных уровнях ЦНС. В этом случае наиболее подходящим термином можно считать «меридиан».[7]

Методология современного исследования предполагает наличие связи специфической функции с определенной структурой биологического объекта. Но морфологические исследования, проведенные в течение последних 50-60 лет, не выявили каких-либо специальных структур, характерных для «канала».

Однако всегда ли для новой или специфической функции требуется специфическая структура? В ряде случаев, отсутствие структуры обеспечивает дополнительную функцию («окно», «дверной проем», «щель» и т. д.).

После публикации фундаментальных работ Р.Вирхова,[8] биология и медицина, преимущественно, изучала физиологию и патологию клеток. Межклеточное пространство, из-за своей структурной и функциональной «простоты», оказалось за пределами интереса медицинской и биологической науки.

В древних китайских трактатах написано: «... во внутреннем пространстве есть тоннели, мысленно обращающий взор в себя может осветить и исследовать их»...[9] Можно представить «каналы» как систему «щелей», протянувшихся между другими, хорошо известными анатомическими образованьями. Поверхность мышц, сосудов, нервов, костей и других структур формируют «наружные стенки», так называемых «каналов и коллатералей». Эти «щели» заполнены продольно ориентированной волокнистой соединительной тканью, межуточным веществом, растворами электролитов и структурированной водой.[10] Вероятно, этого достаточно, чтобы обеспечивать функцию «проведения Qi». Такое толкование каналов соответствует морфологическим данным, полученными в КНДР.[11]

В эксперименте показано, что непосредственный информационный межклеточный обмен осуществляется при участии электромагнитных полей в диапазоне частот 1011 − 1014 Гц.[12,13] В тоже время из радиофизики известно, что для таких частот передающей системой могут быть диэлектрические волноводы.

Передача низкочастотных сигналов успешно реализуется при участии нервной системы. А передача высокочастотных сигналов может быть реализована по «щелевым» или волноводоподобным структурам. Поэтому, «канальная» система является основным претендентом для передачи высокочастотных сигналов, генерируемых клетками.

Теоретические и экспериментальные работы подтверждают, что «каналы» могут играть роль волноводов, по которым распространяются электромагнитные волны различного диапазона.[2,12,14]

Вероятно, «каналы» являются самостоятельной и наиболее древней (в филогенетическом и онтогенетическом смысле) регулирующей системой организма.[15-17]

Морфологическая и функциональная простота обусловливает проблемы верификации системы каналов, поскольку она «... слишком примитивна с точки зрения современной биологии ...».[18] Но, являясь базовой, она объединяет между собой все остальные, более сложные и более молодые системы макроорганизма, а также обеспечивает взаимодействие внутренней среды организма с внешним окружением.[15-17]

Таким образом, с помощью теории «каналов и коллатералей» в ТКМ описывалось общее строение и функция межклеточного пространства и полостей человеческого тела.

2. Физиология и патофизиология клеток

Теория ТКМ описала не только межклеточное пространство, но также физиологию и патологию клеток.

Не разбивая организм на отдельные клетки, древние врачи все же смогли выделить основные функции, характерные для клеток, присвоив этим функциям названия органов: «Печень, Сердце, Селезенка, Легкие, Почки и др.».

Функциональные связи между системами различных клеток представлены посредством законов взаимодействия, а именно:

- «Инь-Ян» (структура-функция, подъем-спад, активация-торможение, симпатический отдел вегетативной нервной системы и парасимпатический отдел, и др.),
- «5 элементов» (взаимодействия между Печенью и Почками, Печенью и Селезенкой, Сердцем и Легкими и т.д.) и т.д.

Согласно теории ТКМ, каждому «органу» соответствуют определенные эмоции, органы чувств, ткани, жидкости тела, цвет, вкус и т.д., поэтому нарушения в органах сопровождаются более обширными и разнообразными клиническими проявлениями, чем поражения каналов и коллатералей.

В процессе развития заболевания, оно может начинаться в межклеточном пространстве и затем распространяться на клетки, или оно может начинаться в клетках, а затем распространяться на межклеточное пространство. В первом случае болезнь прогрессирует «снаружи внутрь», начинаясь в каналах и коллатералях и проникая в органы, а во втором случае, заболевание прогрессирует «изнутри наружу», т.е. формируется в органах и распространяется в каналы и коллатерали.

3. «Энергия» или «Qi»

В организме человека и животных «Qi» и кровь циркулируют по определенным путям, называемым каналами. Существует множество возможных переводов термина «Qi», но любой из них лишь частично охватывает смысл, заложенный в этом слове.

Нередко «Qi» переводится как «воздух», «энергия», «жизненная сила» и др. С помощью «Qi» описывают и оценивают функциональную активность, резистентность или структуру органа.

В практической работе наиболее часто используются следующие термины: «Wei Qi», «Ying Qi» и «Yuan Qi».

«Wei Qi» - это «защитная Qi», соответствующая резистентности, иммунитету и адаптационным возможностям организма.

«Ying Qi» - «питающая Qi» может соответствовать метаболической активности, обеспечивающей функционирование отдельных органов и организма в целом.

«Yuan Qi» - «врожденная» или «наследственная» Qi, которая соответствует наследственной информации, хранящейся в генах.

4. Современные диагностические методы, используемые в ТКМ

Состояние каналов и органов в ТКМ можно описать с помощью «Qi».

Для определения состояния Qi (Полнота или Пустота) проводится измерение электрических параметров кожи в области точек акупунктуры.

Для определения типа заболевания (Жара или Холод) определяется чувствительность кожи к температуре в области проекции ТА, также измеряется температура кожи.

При заболеваниях, локализующихся в каналах и органах, необходимо оценить состояние «питающей» энергии (Ying Qi).

Наиболее известным методом определения Ying Qi является метод Ryodoraku, измеряющий электрическую проводимость главных каналов.

Новым методом сценки состояния «питающей» энергии канала является визуализация точек наименьшего сопротивления в электростатическом поле высоковольтного коронного разряда (аппарат «Acu Vision»).

Ying Qi или «питающая энергия» циркулирует по главным каналам, совершая 25 оборотов в течении дня и 25 оборотов в течение ночи. Эта циркуляция сопровождается изменением функциональной активность каналов и органов.

Изменение функциональной активности канала отражается на его проводимости, а также кожи в области «выхода» канала точки на поверхность кожи.

[Условная схема строения системы «каналов коллатералей»: Влияние изменения уровня «Qi» на электрическую проводимость каналов и точек (*иллюстрация*)].

5. «AcuVision» - аппарат для визуализации точек акупунктуры

Аппарат «AcuVision» объединяет в себе эффекты аппаратов франклинизации и электропунктуры. Заземленный биологический объект помещается в электростатическое поле высоковольтного коронного разряда, которое «стекается» в точки минимального электрического сопротивления на поверхности биообъекта. При этом реализуется эффект аэро-ионной пунктуры.

Для проведения обследования поверхность заземленного биологического объекта покрывается тонким диэлектрическим материалом (полиэтилен, бумага, хлопчатобумажная ткань). В электростатическом поле высоковольтного коронного разряда на диэлектрике возникает голубоватое свечение (феномен люминесценции). Наибольшая яркость люминесценции наблюдается в области максимальной концентрации электростатического поля, т.е. над точками минимального электрического сопротивления.

Диагностически значимыми являются такие параметры, как локализация, яркость и длительность свечения. Аппарат «AcuVision» позволяет проводить исследование

ТА, находящихся на стандартных, фоллевских и бель- (Su Jok) меридианах, а также внемеридианальных ТА и точек различных микросистем (ушная раковина, нос и др.).

При определенных режимах коронный разряд трансформируется в тихий искровой разряд, что обеспечивает реализацию дозированной электропунктуры.

Таким образом, аппарат «AcuVision» обеспечивает визуализацию точек минимального сопротивления на различных биологических объектах (кожа человека и животных, поверхность растений, плодов и фруктов), а также электро- и аэро-ионную пунктуру.

6. Программно-аппаратный комплекс «АНТЭЛ»

С 1950 г. в Японии изучалась возможность оценивать уровень Qi каналов на основании измерения их электрической проводимости. Феномен повышенной электропроводимости каналов получил название «*Ryodoraku*». В результате многочисленных экспериментов было доказано, что судить о состоянии канала можно на основании измерения одной репрезентативной точки, лежащей на исследуемом канале.

Диагностический программно-аппаратный комплекс «АНТЭЛ» разработан для врачей, использующих иглоукалывание, прижигание, КВЧ-пунктуру, лазеропунктуру, электропунктуру, а также приборы типа «СКЭНАР». Измерение электрической проводимости каналов в точках «Юань» проводится по методу *Ryodoraku*.

Результаты измерения автоматически вводятся в карту Риодораку. Программа вычисляет коридор индивидуальной нормы пациента. Каналы, результаты измерения которых выше коридора нормы, находятся в состоянии Полноты. Каналы, результаты измерения которых ниже коридора нормы, находятся к состоянии Пустоты.

Используя принципы и законы ТКМ, программа рассчитывает синдромный диагноз и рекомендует точки и зоны воздействия. Врач может моделировать «виртуальное» лечение, оценивать предполагаемый эффект и, при необходимости, ввести изменения *в* рекомендуемую рецептуру.

«12 каналов» - наиболее простой вариант анализа, используемый в расчетах при лечении острых или локальных нарушений.

«Пузырьки» - интегральный анализ состояния, основанный на критерии «хуже-лучше».

Анализ состояния организма на основании закона «5 элементов» реализуется в опциях «Звезды». Врач может рассчитать взаимодействие между элементами, состоящими из каналов Инь и Ян раздельно и вместе.

«Ян-Инь» анализ интегрально отражает результаты сравнения каналов Ян и Инь, Рук и Ног, а также левой и правой ветвей каждого канала. Различия между каналами Ян и Инь рассчитываются в процентах.

Результаты проводимых измерений и вычислений отражаются в цифровом виде в разделе «Суммы» и заносятся в базу данных. Это позволяет рассчитать признаки, характерные для различных нозологических форм.

Таким образом, используя современную диагностическую аппаратуру, врач имеет уникальную возможность проведения научных исследований, базирующихся на законах и принципах традиционной китайской медицины.

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Luminescencing sports and heterogenous responses in fingertip microcirculation

O.Hänninen, S.Kolmakow, K.Korotkov, R. Avakyan, M.Teppone

Trends in Biomedicine in Finland XII: From leptin to melatonin
Annual Meeting of Finnish Physiological Society
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University of Joensuu, Joensuu, Finland (abstracts book).
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Leptiinistä melatoniiniin

Suomen Fysiologiyhdistyksen vuosisymposiumi
24.-25.11.2000
Joensuun Yliopisto, Joensuu

TRENDS IN BIOMEDICINE IN FINLAND XII:
From leptin to melatonin

Annual Meeting of Finnish Physiological Society:
24th and 25th November, 2000
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Symposiumin esitelmälyhennelmät

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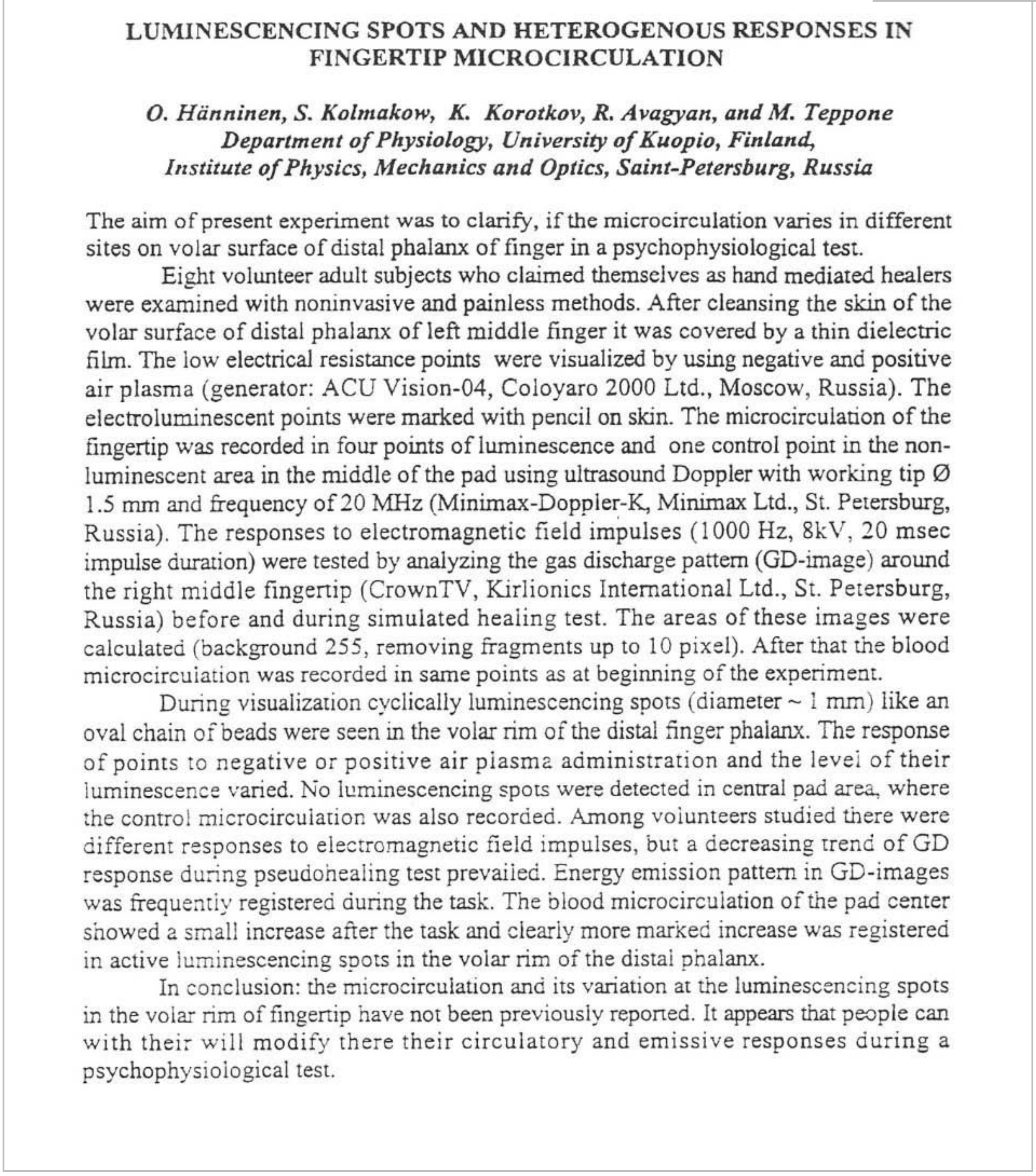
These sessions were arranged by the Finnish Physiological Society in collaboration with the Finnish Society for Biological Medicine.



LUMINESCENCING SPOTS AND HETEROGENOUS RESPONSES IN FINGERTIP MICROCIRCULATION

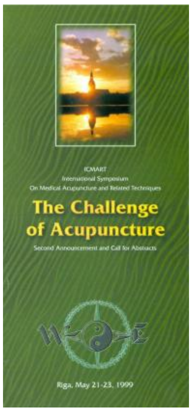
O. Hänninen, S. Kolmakow, K. Korotkov, R. Avagyan, and M. Teppone
Department of Physiology, University of Kuopio, Finland,
Institute of Physics, Mechanics and Optics, Saint-Petersburg, Russia

The aim of present experiment was to clarify, if the microcirculation varies in different sites on volar surface of distal phalanx of finger in a psychophysiological test.

Eight volunteer adult subjects who claimed themselves as hand mediated healers were examined with noninvasive and painless methods. After cleansing the skin of the volar surface of distal phalanx of left middle finger it was covered by a thin dielectric film. The low electrical resistance points were visualized by using negative and positive air plasma (generator: ACU Vision-04, Coloyaro 2000 Ltd., Moscow, Russia). The electroluminescent points were marked with pencil on skin. The microcirculation of the fingertip was recorded in four points of luminescence and one control point in the non-luminescent area in the middle of the pad using ultrasound Doppler with working tip Ø 1.5 mm and frequency of 20 MHz (Minimax-Doppler-K, Minimax Ltd., St. Petersburg, Russia). The responses to electromagnetic field impulses (1000 Hz, 8kV, 20 msec impulse duration) were tested by analyzing the gas discharge pattern (GD-image) around the right middle fingertip (CrownTV, Kirlionics International Ltd., St. Petersburg, Russia) before and during simulated healing test. The areas of these images were calculated (background 255, removing fragments up to 10 pixel). After that the blood microcirculation was recorded in same points as at beginning of the experiment.

During visualization cyclically luminescencing spots (diameter ~ 1 mm) like an oval chain of beads were seen in the volar rim of the distal finger phalanx. The response of points to negative or positive air plasma administration and the level of their luminescence varied. No luminescencing spots were detected in central pad area, where the control microcirculation was also recorded. Among volunteers studied there were different responses to electromagnetic field impulses, but a decreasing trend of GD response during pseudohealing test prevailed. Energy emission pattern in GD-images was frequently registered during the task. The blood microcirculation of the pad center showed a small increase after the task and clearly more marked increase was registered in active luminescencing spots in the volar rim of the distal phalanx.

In conclusion: the microcirculation and its variation at the luminescencing spots in the volar rim of fingertip have not been previously reported. It appears that people can with their will modify there their circulatory and emissive responses during a psychophysiological test.


ICMART
International Symposium
On Medical Acupuncture and Related Techniques
The Challenge of Acupuncture
Second Announcement and Call for Abstracts
Riga, May 21-23, 1999

New diagnostic methods in Acupuncture

R.Avakian, M.Teppone, S.Vesnin

ICMART '99 International Medical Acupuncture Symposium
May 21-23, Riga, 1999. p. 7
https://med-vetacupuncture.org/english/articles/icmart99/ab3.htm

«**Acu Vision**» is a new device developed for diagnostic and therapeutic purpose. It combines effects of air-ion therapy and electropuncture.

The grounded biological object (man, animal, plant, fruit) is placed into the electrostatic field created by a high-voltage corona discharge. Minimum electrical resistance points are the places on the skin surface where air-ions are absorbed. In this case effects of air-ion puncture is realized

For diagnostic purpose object must be covered by a thin dielectric layer (a paper, cotton fabric, polyester film, etc.). Electrostatic field intensity is maximum at the points of minimum skin resistance and just at these points luminescence originates as a result of transformation of corona discharge into spark discharge. The luminescence brightness and duration is a diagnostic criteria. The suggested diagnostic method allows to estimate the functional state of analyzed biological object using corporal (meridian and extraordinary) points as well as points of various micro-systems (ear, nose, palm, sole, etc.). At the same time electro-puncture effects is realized.

The complex («Acu Vision» – CCD – interface – PC) and special software provides automatic differential diagnostic based both TCM syndrome and modern nosological approach.

«**RTM-01**» medical radiothermograph consists of the infrared sensor and microwave radiometers with the special sofware and PC. It has been developed for the early detection of internal organs diseases. The detection of various pathology is conducted by measuring intensity of natural electromagnetic radiation from the patients' internal tissues at microwave range and from the skin at the infrared range. This radiation intensity is proportional to the temperature of tissues. The depth of the internal thermal detection is from 3 to 7 cm. As the changes in the tissues temperature precede the structural changes, RTM-01 radiothermograph can be used to diagnose diseases at the early stage.

Temperature field distribution of the patients suffering from the exact disease and organs should be compared with the same parameters of the healthy person. The typical diagnostic criteria characterized for the analyzed disease and organ are revealed and displayed as a 2-D diagram. It resulted in the compact zones named as a «risk areas». If patient's RTM-features are located within the «risk areas», software gives a message that this patient has the exact disease. Reliability of this conclusion has to increase as data is being collected.

The clinical trial conducted among more than 2400 women has shown that radiometric techniques with computer diagnostics ensure high efficiency for the diagnosis of the breast cancer (the detection of breast cancer is above 90 %).

One may apply RTM-01 also to control the efficiency of any kind of therapy, including acupuncture and EHF-puncture. During these method of treatment temperature changes on the skin surface and inside the body correlates with the arrival of Qi phenomenon and helps a doctor to optimize the treatment regimen.

Due to the absolute harmlessness of this examination it can be applied many times without any danger.

Радиотермометрия – метод ранней диагностики и контроля за проводимым лечением

С.Веснин, А.Вайсблат, Н.Тихомирова, Р.Авакян, М.Теппоне

Теоретические и клинические аспекты применения биорезонансной и мультирезонансной терапии
V Международная конференция, Москва, 16-18 апреля 1999,
(тезисы докладов) М.: «Имедис», 1999: 289-291 http://imedis.ru/pages/151

Метод СВЧ радиотермометрии (далее РТМ) представляет собой не инвазивную пассивную процедуру определения тепловой активности тканей. Поскольку изменение температуры тканей предшествует структурным изменениям, имеется принципиальная возможность обнаружения заболеваний на ранних стадиях. По сравнению с инфракрасной (ИК) термографией, измеряющей поверхностную температуру кожных покровов, РТМ дает информацию о распределении температурных полей на глубине нескольких сантиметров.

Важным свойством РТМ является ее абсолютная безвредность, что позволяет проводить многократные обследования, наблюдать динамику заболевания и правильно выбирать тактику лечения.

Для использования РТМ в клинических условиях, проведена работа по совершенствованию методов съема, обработки и отображения информации.

При РТМ-диагностике учитываются такие показатели как, термоасимметрия и температурный градиент. Для формирования программы, реализующей дифференциальную диагностику, набирается база данных о температуре здоровых людей и больных различными заболеваниями. Затем выделяются характерные признаки в виде совокупности численных значений. При этом учитываются возрастные и половые особенности изменения температуры.

Исследование внутренних температурных полей пациента завершается сравнением с имеющейся базой данных и постановкой предполагаемого диагноза. По мере накопление информации достоверность получаемых заключений повышается.

Схожую РТМ – картину дают острые воспалительные и онкологические заболевания. Однако, повторное РТМ – обследование, проведенное после противовоспалительной терапии повышает точность предполагаемого диагноза.

Серия исследований, проведенных в различных маммологических центрах г. Москвы, показала, что РТМ - диагностика с применением компьютерных методов обработки дает высокую выявляемость рака молочной железы (более 90%), причем в ряде случаев, более раннюю, чем традиционные методы (маммография и ультразвуковое исследование).

Принципиальная возможность ранней диагностики онкологических и воспалительных заболеваний и проведения динамического контроля в процессе лечения представляют интерес для использования РТМ – технологии в онкологических и неспециализированных медицинских учреждениях.   .

ACUVISION - a new solution of the Acupoints visualization

R. Avagyan, M.Teppone

The 5th International Baltic Congress on Medical Acupuncture and Related Techniques
Acupuncture in Modern Society, May 28-31, 1998, Jurmala, (abstracts), p. 3

All known methods and devices designed for detection and action upon the minimum-resistance zones and acupoints are based on contact measurement of surface conductivity by a scanning electrode [*Y.Nacatani*, *R.Voll*, etc.]. These methods have the following disadvantages: existence of mechanical and electrical contact; positional errors of scanning electrode resulting in low accuracy of point localization; effect of subjective factors (electrode inclination, exerted pressure, etc.) on the measurement accuracy; interference of effects unrelated with the measured parameters: skin injuries, sweat, grease, temperature variations, etc

To avoid all problems described above a new device for non-contact action upon the minimum-resistance points of human or animals body has been developed. It was reached by a method in which the initially grounded object is placed in electrostatic field created by a high-voltage corona discharge in air and stimulating luminescence of minimum-resistance points on the object surface. The method thus provides an accurate localization of desired points. To enhance the points' luminescence, the analyzed object must be covered by a thin dielectric layer (a paper, cotton fabric, polyster film, etc.).

Electrostatic field intensity is maximum in the points of minimum skin resistance. Luminescence originates in the maximum field intensity points and reflects the functional state of the biological object. The suggested diagnostic method allows to estimate the functional state of analyzed biological object using corporal (channel and out of channel) points as well as points of various micro-systems.

The suggested method also may be applied for air-ion therapy as well as for electric puncture therapy. But this version of electro-puncture is non-contact, by means of the corona discharge affects on the points having minimum electric resistance only and procedure duration is determined by luminescence time of affected points.

One may apply it both in traditional Chinese medicine and its present modifications, including points selected by R.Voll, P.-J. Woo (Su Jok), Nogier (auriculotherapy), etc.

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(71)(72) Applicants and Inventors: AVAGYAN, Romen @ [AM/AM]; Apartment 1, 38 Abovyan Street, Yerevan, 375009 (AM). TEPPONE, Michail [RU/RU]; Apartment 92, 8 Pionerskaja Street, Tomilino, Moscow obl., 140070 (RU).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: TAUBE, Alex [UA/UA]; Apartment 79, 10 Gnath Jura Street, Kiev, 252148 (UA).

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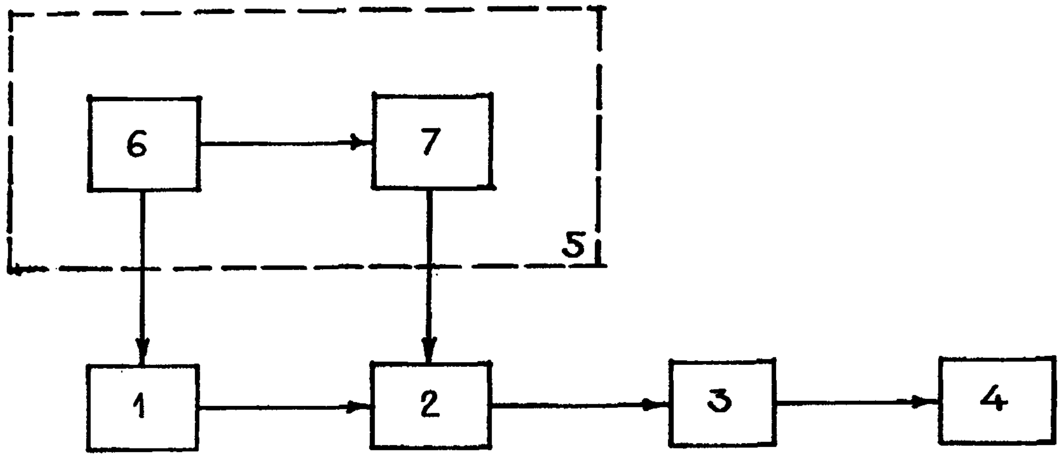
(54) Title: A METHOD OF EHF PUNCTURE (OR MMW THERAPY) AND A DEVICE THERETO



(57) Abstract

This invention relates to medicine, and particularly to reflexotherapy, and is designed for treatment of various diseases and dysfunctions in the organism. It is the aim of this invention to enhance the therapeutic effect and reduce the treatment time by using a combined action of broadband noiselike and coherent EHF radiation at a fixed frequency on biologically active points (BAPs) and zones (BAZes) selected by a syndrome diagnosis of Traditional Chinese Medicine (TCM), or instrumental methods of functional diagnostics of the channels and acupoints state. The suggested method of EHF puncture and the device thereto provide an action on BAPs and BAZes, selected by TCM syndrome diagnosis, either by noiselike or combined noiselike and coherent radiation at a fixed frequency. Coherent radiation frequencies correspond to the therapeutic ones.

A Method of Non-Contact Action upon the minimum-resistance zones and points of objects and a Device therefor

R.Avagyan, M.Avagyan, M. Teppone.

Application PCT/AM1998/000001, 1998-02-12; Publication of WO1998037927
https://patentscope.wipo.int/search/en/detail.jsf?docId=WO1998037927&_cid=P21-KS2UUG-85232-1

Summary

(EN) The invention relates to medicine, and particularly to reflexotherapy, as well as to defectoscopy. A method of non-contact upon the minimum resistance zones and points or organic and non-organic objects, and a corresponding device are disclosed, for the purpose of indication, state evaluation and therapy. In the preferred embodiment of the invention, the grounded object is placed in the electrostatic field created by a high-voltage corona discharge in air and luminescence of minimum-resistance zones and points on the object surface is stimulated. The method thus provides an accurate localization of desired zones and points. The device includes a power-supply unit (1), a controlled infrasound (IS) generator (2), an overtone frequency generator (3), a power amplifier (4), a high-voltage unit (5) and electrodes (8), all said units being connected in series and mounted inside the control panel and scanning head casings, and it additionally includes a controlled infrasound, the high voltage unit and electrodes being mounted in the scanning head casing.

Related patent

AU1998062835 - A method of non-contact action upon the minimum-resistance zones and points of objects and a device therefor

https://patentscope.wipo.int/search/en/detail.jsf?docId=WO1998037927&_cid=P21-KS2UUG-85232-1

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(EN) The invention relates to medicine, and particularly to reflexotherapy, as well as to defectoscopy. A method of non-contact upon the minimum resistance zones and points or organic and non-organic objects, and a corresponding device are disclosed, for the purpose of indication, state evaluation and therapy. In the preferred embodiment of the invention, the grounded object is placed in the electrostatic field created by a high-voltage corona discharge in air and luminescence of minimum-resistance zones and points on the object surface is stimulated. The method thus provides an accurate localization of desired zones and points. The device includes a power-supply unit (1), a controlled infrasound (IS) generator (2), an overtone frequency generator (3), a power amplifier (4), a high-voltage unit (5) and electrodes (8), all said units being connected in series and mounted inside the control panel and scanning head casings, and it additionally includes a controlled infrasound, the high voltage unit and electrodes being mounted in the scanning head casing.

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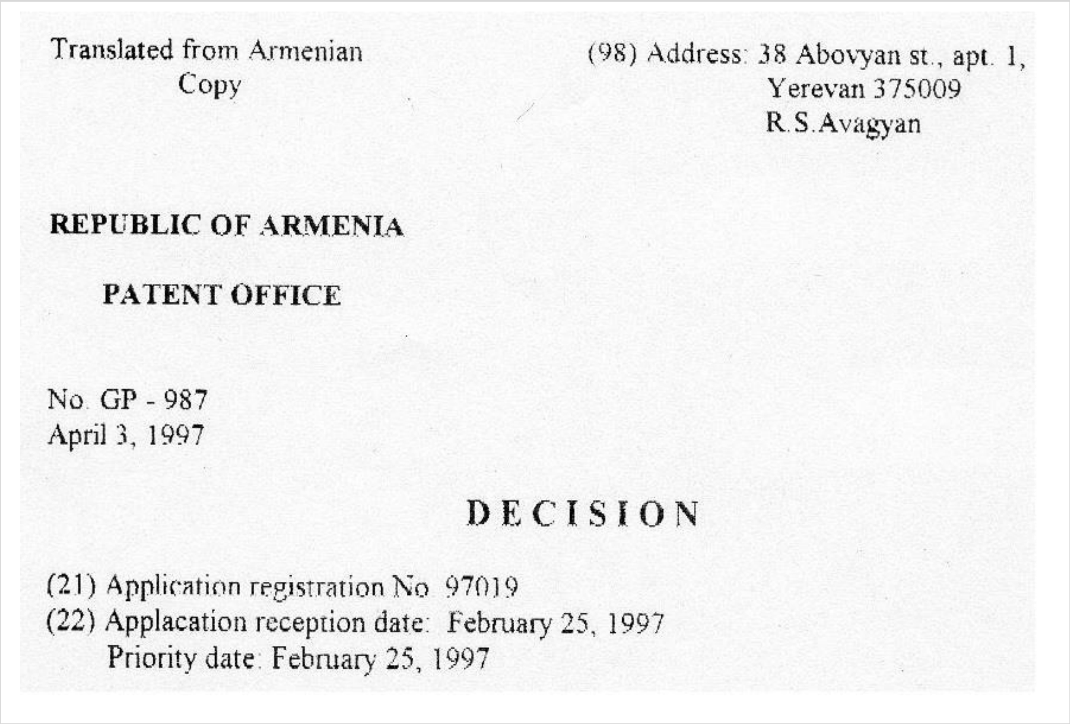
Method
# of non-contact influence on objects' zone and points of minimum resistance and device for its implementation

Mikhail Teppone, Romen Avakyan,

Republic of Armenia, Patent No GP - 987, April 3, 1997
https://archive.org/details/acuvision-patent



Translated from Armenian
Copy

(98) Address: 38 Abovyan st., apt. 1,
Yerevan 375009
R.S.Avagyan

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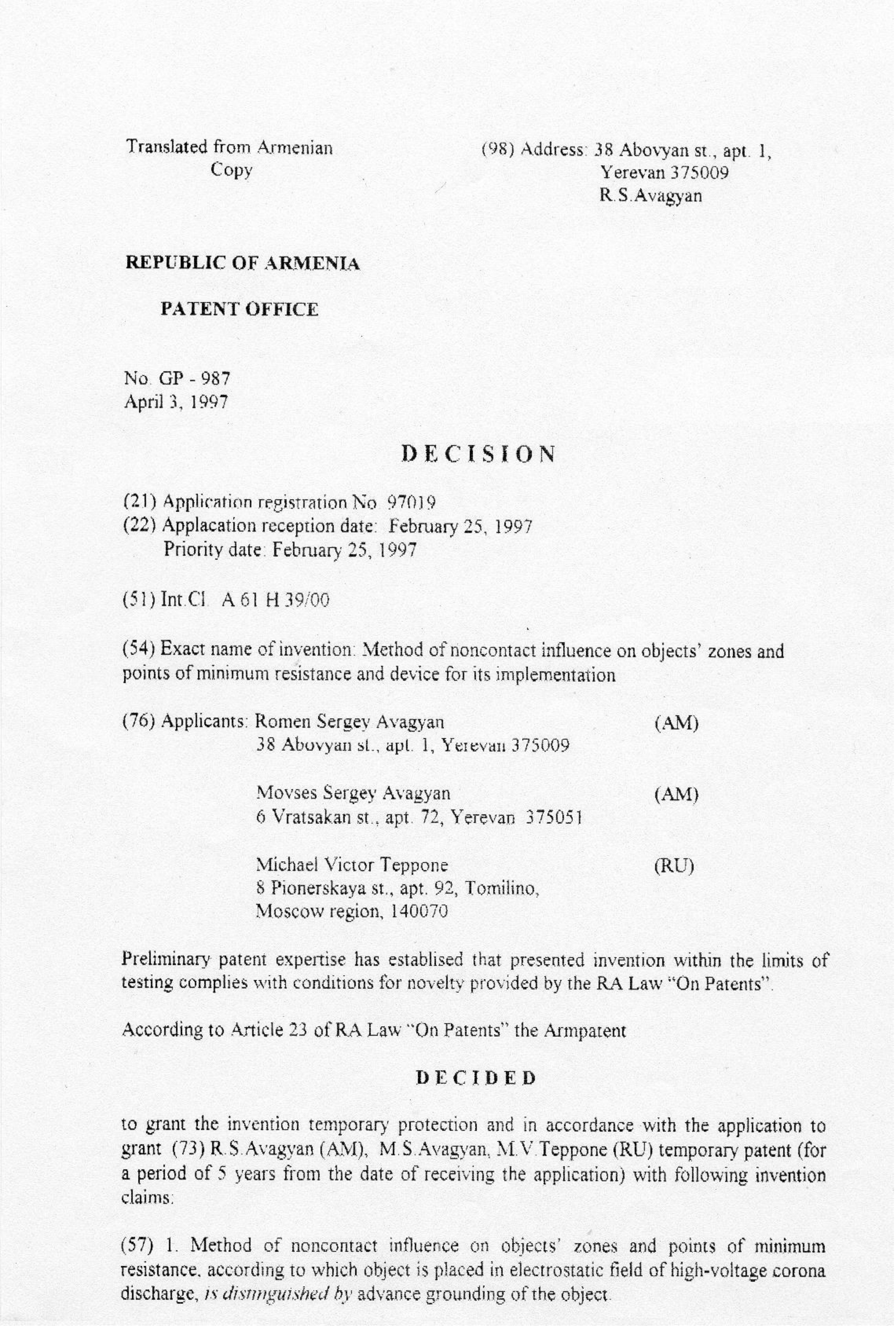
(22) Applacation reception date: February 25, 1997
Priority date: February 25, 1997



Translated from Armenian
Copy

(98) Address: 38 Abovyan st., apt. 1,
Yerevan 375009
R.S.Avagyan

REPUBLIC OF ARMENIA

PATENT OFFICE

No. GP - 987
April 3, 1997

DECISION

(21) Application registration No. 97019
(22) Applacation reception date: February 25, 1997
Priority date: February 25, 1997

(51) Int.Cl. A 61 H 39/00

(54) Exact name of invention: Method of noncontact influence on objects' zones and points of minimum resistance and device for its implementation

(76) Applicants:	Romen Sergey Avagyan 38 Abovyan st., apt. 1, Yerevan 375009	(AM)
	Movses Sergey Avagyan 6 Vratsakan st., apt. 72, Yerevan 375051	(AM)
	Michael Victor Teppone 8 Pionerskaya st., apt. 92, Tomilino, Moscow region, 140070	(RU)

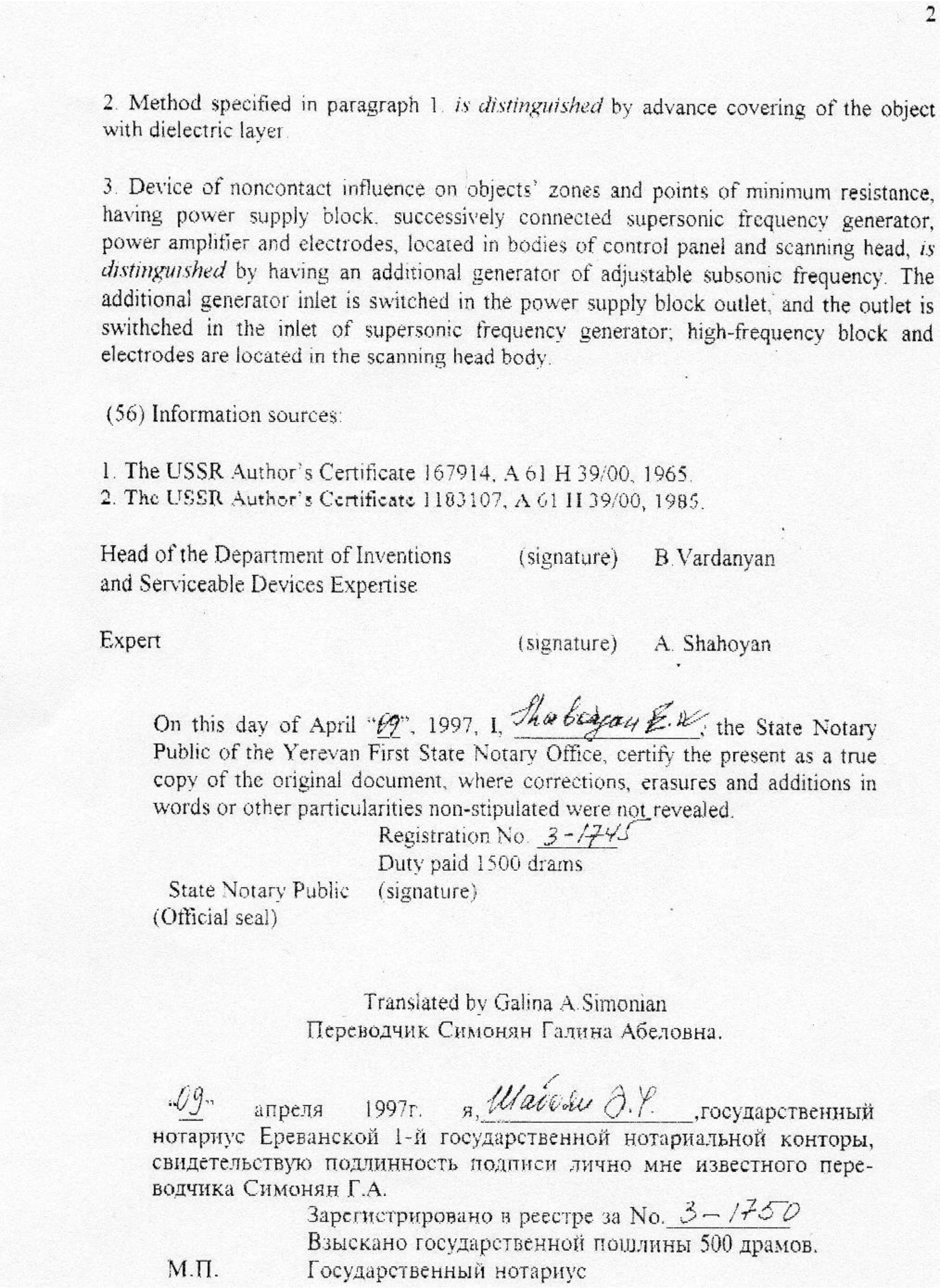
Preliminary patent expertise has establised that presented invention within the limits of testing complies with conditions for novelty provided by the RA Law "On Patents".

According to Article 23 of RA Law "On Patents" the Armpatent

DECIDED

to grant the invention temporary protection and in accordance with the application to grant (73) R.S.Avagyan (AM), M.S.Avagyan, M.V.Teppone (RU) temporary patent (for a period of 5 years from the date of receiving the application) with following invention claims:

(57) 1. Method of noncontact influence on objects' zones and points of minimum resistance, according to which object is placed in electrostatic field of high-voltage corona discharge, *is distinguished by* advance grounding of the object.



2. Method specified in paragraph 1. *is distinguished* by advance covering of the object with dielectric layer.

3. Device of noncontact influence on objects' zones and points of minimum resistance, having power supply block, successively connected supersonic frequency generator, power amplifier and electrodes, located in bodies of control panel and scanning head, *is distinguished* by having an additional generator of adjustable subsonic frequency. The additional generator inlet is switched in the power supply block outlet, and the outlet is swithched in the inlet of supersonic frequency generator; high-frequency block and electrodes are located in the scanning head body.

(56) Information sources:

1. The USSR Author's Certificate 167914, A 61 H 39/00, 1965.
2. The USSR Author's Certificate 1183107, A 61 H 39/00, 1985.

Head of the Department of Inventions and Serviceable Devices Expertise	(signature)	B. Vardanyan
Expert	(signature)	A. Shahoyan

On this day of April "09", 1997, I, Shabazyan E.N., the State Notary Public of the Yerevan First State Notary Office, certify the present as a true copy of the original document, where corrections, erasures and additions in words or other particularities non-stipulated were not revealed.

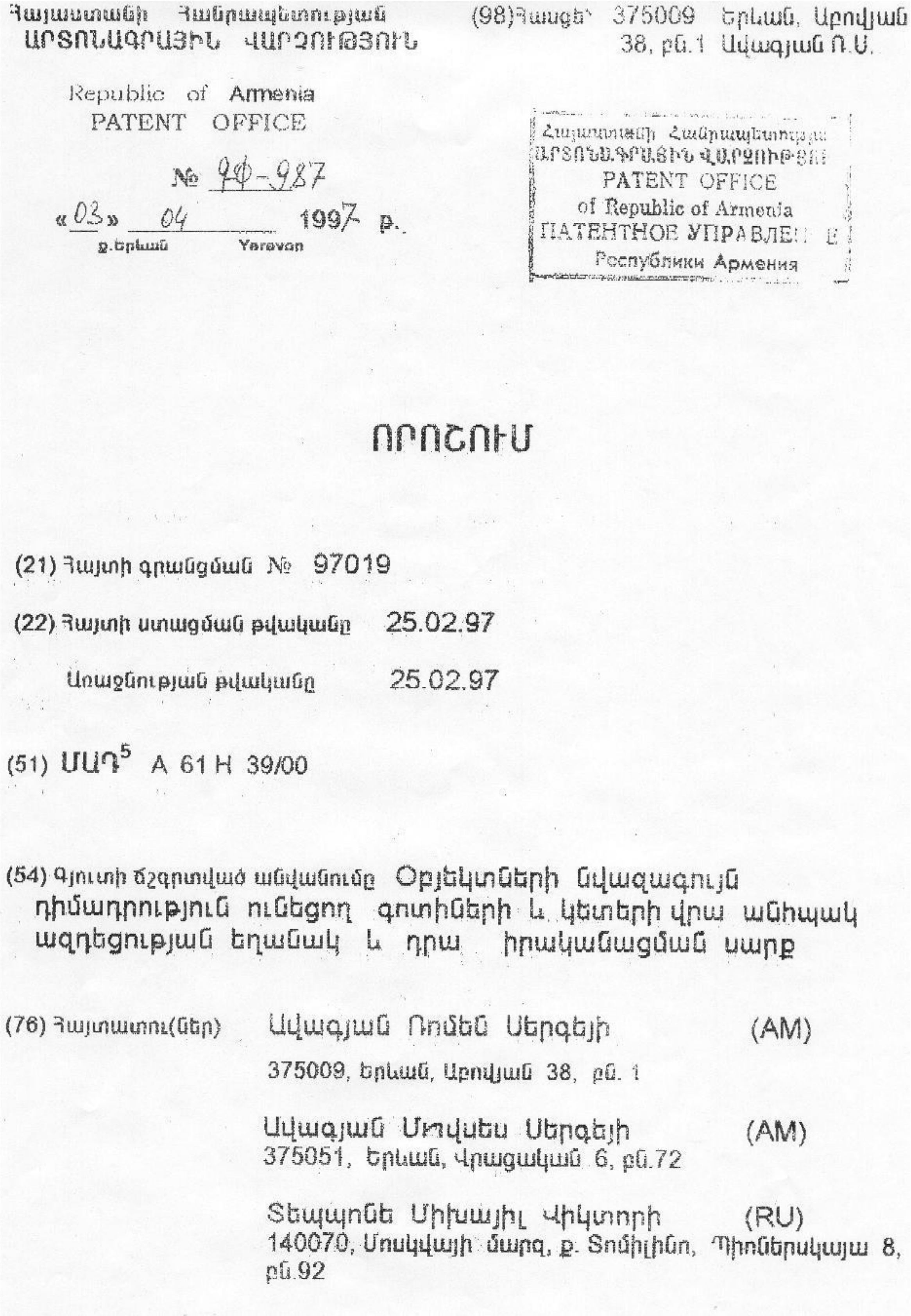
Registration No. 3-1745
Duty paid 1500 drams
State Notary Public (signature)
(Official seal)

Translated by Galina A. Simonian
Переводчик Симонян Галина Абеловна.

"09" апреля 1997г. я, Шабазян Э.Н., государственный нотариус Ереванской 1-й государственной нотариальной конторы, свидетельствую подлинность подписи лично мне известного переводчика Симонян Г.А.

Зарегистрировано в реестре за No. 3-1750
Взыскано государственной пошлины 500 драмов.
М.П. Государственный нотариус

Republic of Armenia, Patent No GP - 987, April 3, 1997



Հայաստանի Հանրապետության
ԱՐՏՈՆԱԳՐԱՅԻՆ ՎԱՐՉՈՒԹՅՈՒՆ

(98) Հասցե՝ 375009 Երևան, Աբովյան
38, բն.1 Ավագյան Ռ.Ս.

Republic of Armenia
PATENT OFFICE

№ ԳՓ-987
«03» 04 1997 թ.
ք.Երևան Yerevan

Հայաստանի Հանրապետության
ԱՐՏՈՆԱԳՐԱՅԻՆ ՎԱՐՉՈՒԹՅՈՒՆ
PATENT OFFICE
of Republic of Armenia
ПАТЕНТНОЕ УПРАВЛЕНИЕ
Республики Армения

ՈՐՈՇՈՒՄ

(21) Հայտի գրանցման № 97019

(22) Հայտի ստացման թվականը 25.02.97

Առաջնության թվականը 25.02.97

(51) ՄԱԴ^5 A 61 H 39/00

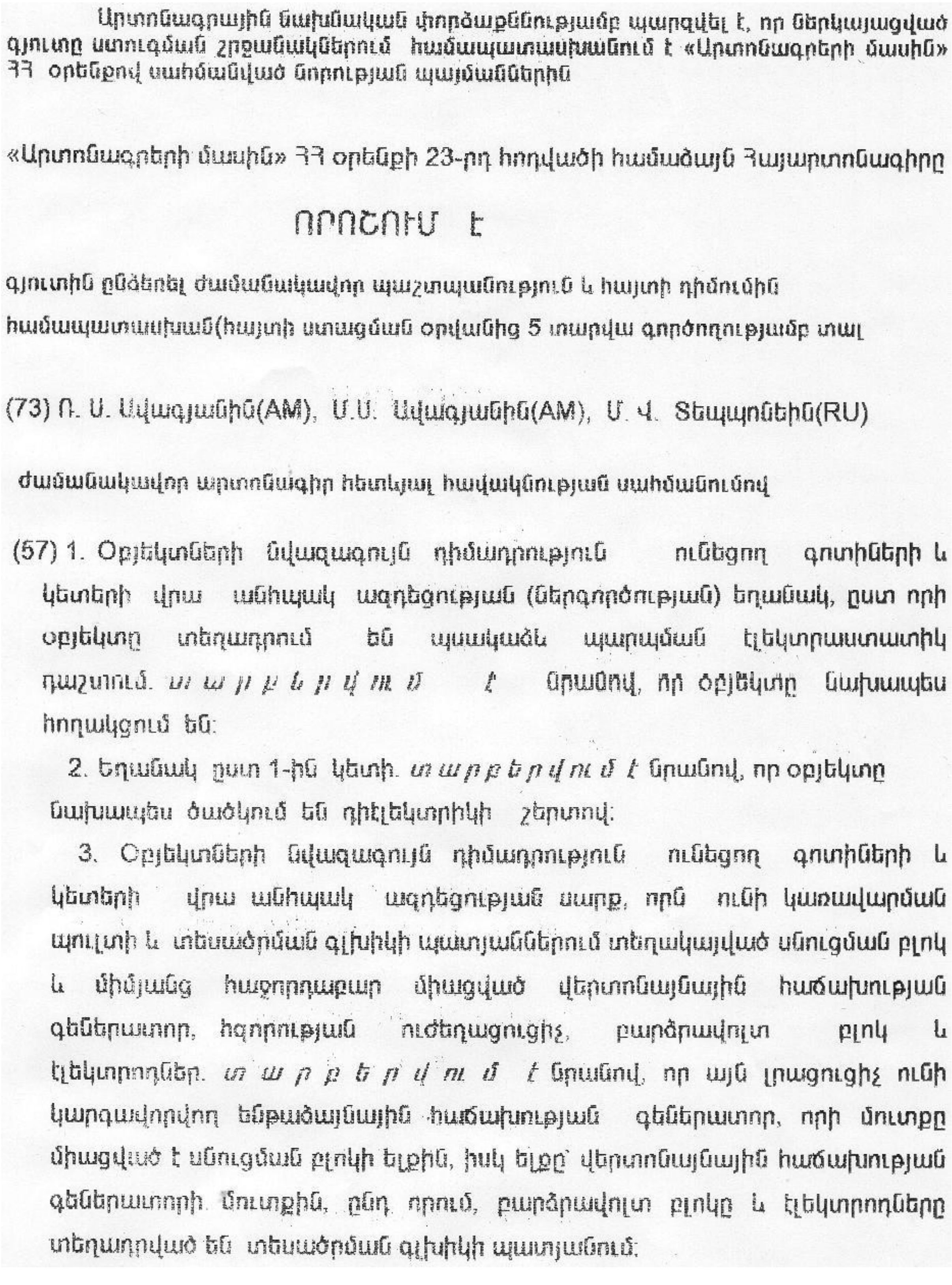
(54) Գյուտի ճշգրտված անվանումը Օբյեկտների նվազագույն դիմադրություն ունեցող գոտիների և կետերի վրա անհպակ ազդեցության եղանակ և դրա իրականացման սարք

(76) Հայտատու(ներ)

Ավագյան Ռոմեն Սերգեյի (AM)
375009, Երևան, Աբովյան 38, բն. 1

Ավագյան Մովսես Սերգեյի (AM)
375051, Երևան, Վրացական 6, բն.72

Տեպլոնե Միխայիլ Վիկտորի (RU)
140070, Մոսկվայի մարզ, ք. Տոմիլինո, Պիոներսկայա 8, բն.92



Արտոնագրային նախնական փորձաքննությամբ պարզվել է, որ ներկայացված գյուտը ստուգման շրջանակներում համապատասխանում է «Արտոնագրերի մասին» ՀՀ օրենքով սահմանված նորության պայմաններին

«Արտոնագրերի մասին» ՀՀ օրենքի 23-րդ հոդվածի համաձայն Հայարտոնագիրը

ՈՐՈՇՈՒՄ Է

գյուտին ընձեռել ժամանակավոր պաշտպանություն և հայտի դիմումին համապատասխան(հայտի ստացման օրվանից 5 տարվա գործողությամբ տալ

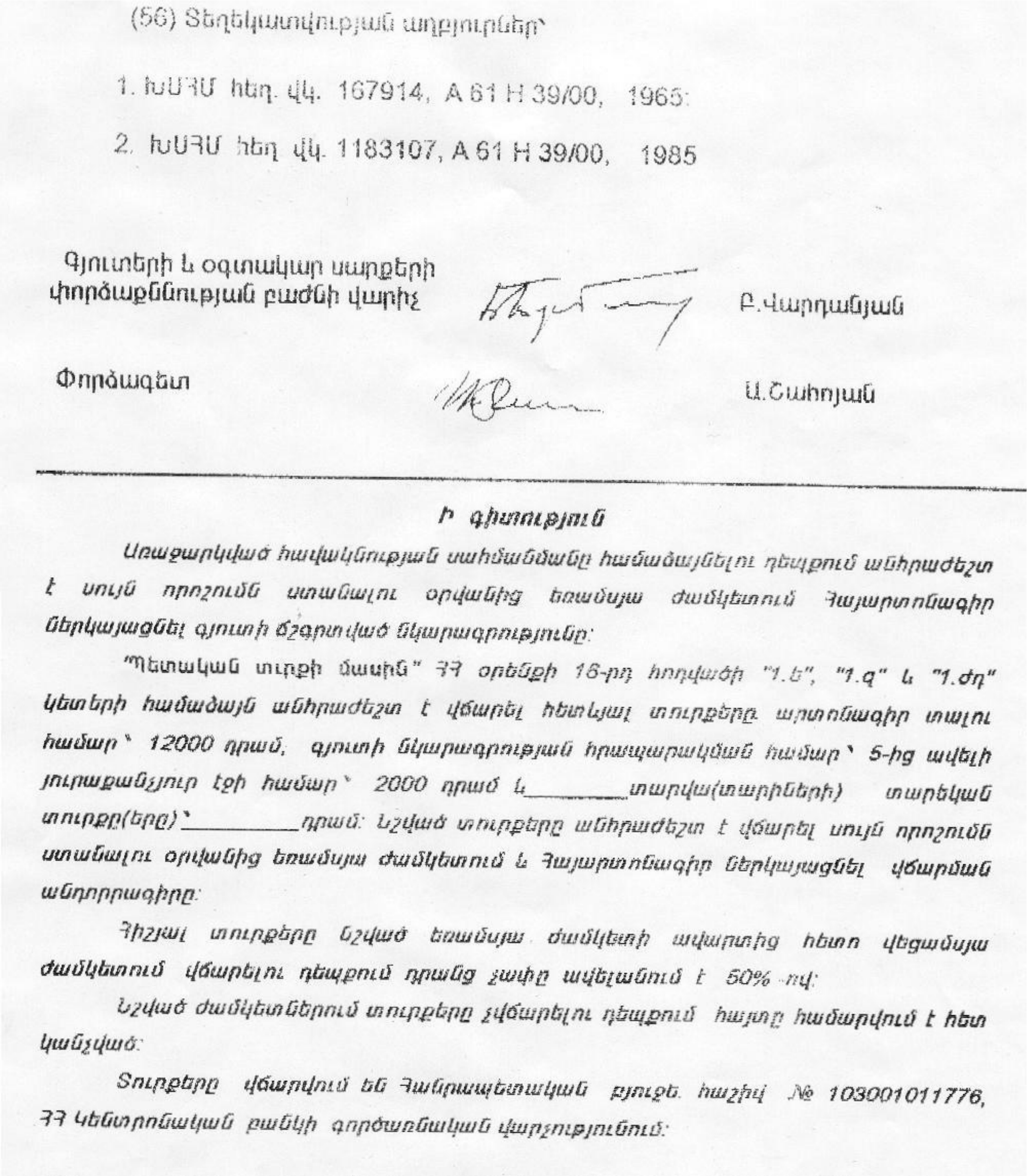
(73) Ռ. Ս. Ավագյանին(AM), Մ.Ս. Ավագյանին(AM), Մ. Վ. Տեպլոնեին(RU)

ժամանակավոր արտոնագիր հետևյալ հավակնության սահմանումով

(57) 1. Օբյեկտների նվազագույն դիմադրություն ունեցող գոտիների և կետերի վրա անհպակ ազդեցության (ներգործության) եղանակ, ըստ որի օբյեկտը տեղադրում են պսակաձև պարպման էլեկտրաստատիկ դաշտում, *տարբերվում է* նրանով, որ օբյեկտը նախապես հողակցում են:

2. Եղանակ ըստ 1-ին կետի, *տարբերվում է* նրանով, որ օբյեկտը նախապես ծածկում են դիէլեկտրիկի շերտով:

3. Օբյեկտների նվազագույն դիմադրություն ունեցող գոտիների և կետերի վրա անհպակ ազդեցության սարք, որն ունի կառավարման պուլտի և տեսածրման գլխիկի պատյաններում տեղակայված սնուցման բլոկ և միմյանց հաջորդաբար միացված վերտոնայնային հաճախության գեներատոր, հզորության ուժեղացուցիչ, բարձրավոլտ բլոկ և էլեկտրոդներ, *տարբերվում է* նրանով, որ այն լրացուցիչ ունի կարգավորվող ենթաձայնային հաճախության գեներատոր, որի մուտքը միացված է սնուցման բլոկի ելքին, իսկ ելքը՝ վերտոնայնային հաճախության գեներատորի մուտքին, ընդ որում, բարձրավոլտ բլոկը և էլեկտրոդները տեղադրված են տեսածրման գլխիկի պատյանում:



(56) Տեղեկատվության աղբյուրներ՝

1. ԽՍՀՄ հեղ. վկ. 167914, A 61 H 39/00, 1965։

2. ԽՍՀՄ հեղ վկ. 1183107, A 61 H 39/00, 1985

Գյուտերի և օգտակար սարքերի
փորձաքննության բաժնի վարիչ Բ.Վարդանյան

Փորձագետ Ա.Շահոյան

Ի գիտություն

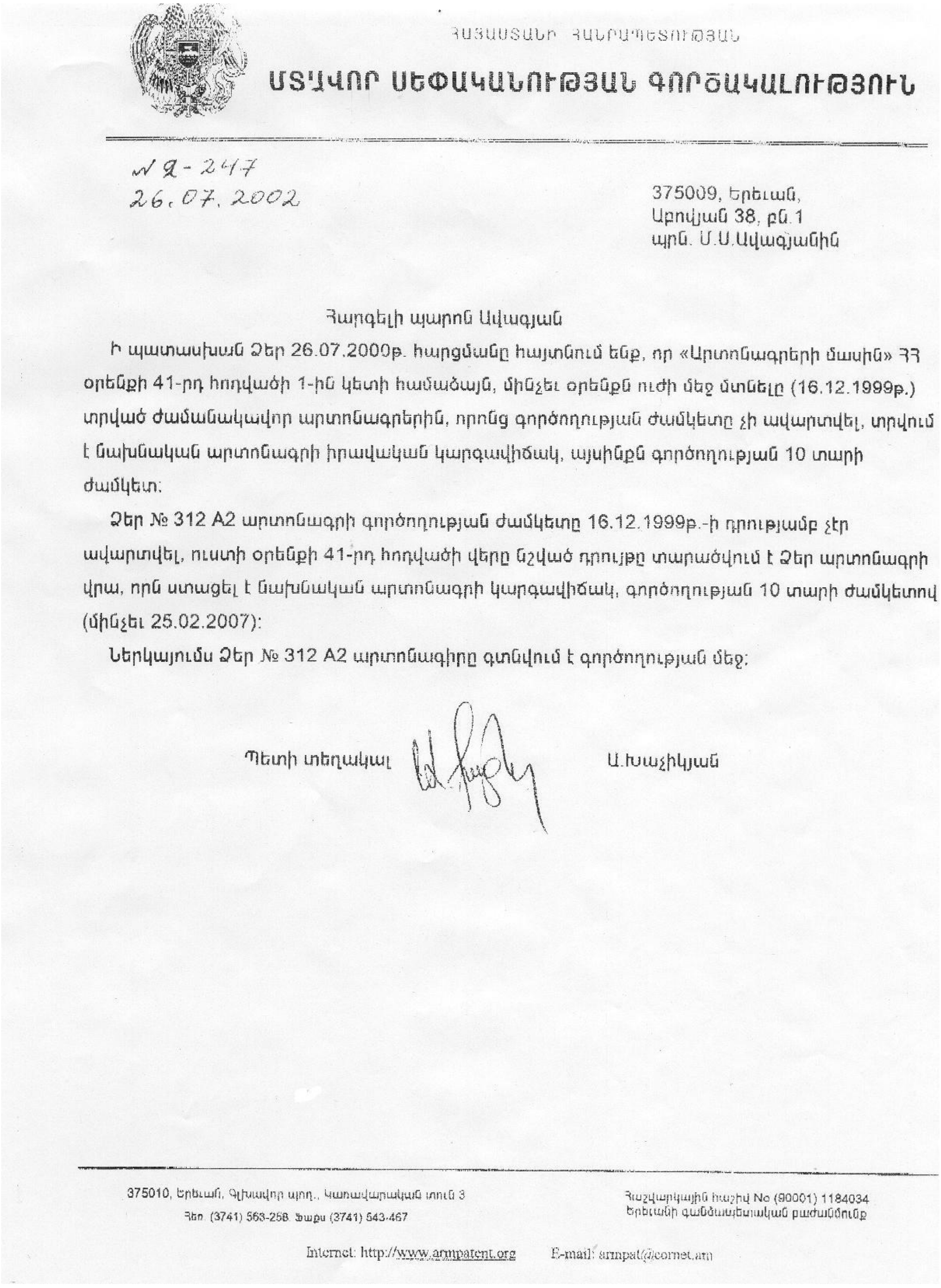
Առաջարկված հավակնության սահմանմանը համաձայնելու դեպքում անհրաժեշտ է սույն որոշումն ստանալու օրվանից եռամսյա ժամկետում Հայարտոնագիր ներկայացնել գյուտի ճշգրտված նկարագրությունը։

"Պետական տուրքի մասին" ՀՀ օրենքի 16-րդ հոդվածի "1.ե", "1.զ" և "1.ժդ" կետերի համաձայն անհրաժեշտ է վճարել հետևյալ տուրքերը. արտոնագիր տալու համար՝ 12000 դրամ, գյուտի նկարագրության հրապարակման համար՝ 5-ից ավելի յուրաքանչյուր էջի համար՝ 2000 դրամ և__________տարվա(տարիների) տարեկան տուրքը(երը)՝____________դրամ։ Նշված տուրքերը անհրաժեշտ է վճարել սույն որոշումն ստանալու օրվանից եռամսյա ժամկետում և Հայարտոնագիր ներկայացնել վճարման անդորրագիրը։

Հիշյալ տուրքերը նշված եռամսյա ժամկետի ավարտից հետո վեցամսյա ժամկետում վճարելու դեպքում դրանց չափը ավելանում է 50%-ով։

Նշված ժամկետներում տուրքերը չվճարելու դեպքում հայտը համարվում է հետ կանչված։

Տուրքերը վճարվում են Հանրապետական բյուջե. հաշիվ № 103001011776, ՀՀ Կենտրոնական բանկի գործառնական վարչությունում։



ՀԱՅԱՍՏԱՆԻ ՀԱՆՐԱՊԵՏՈՒԹՅԱՆ
ՄՏԱՎՈՐ ՍԵՓԱԿԱՆՈՒԹՅԱՆ ԳՈՐԾԱԿԱԼՈՒԹՅՈՒՆ

N Զ-247
26.07.2002

375009, Երեւան,
Աբովյան 38, բն.1
պրն. Մ.Ս.Ավագյանին

Հարգելի պարոն Ավագյան

Ի պատասխան Ձեր 26.07.2000թ. հարցմանը հայտնում ենք, որ «Արտոնագրերի մասին» ՀՀ օրենքի 41-րդ հոդվածի 1-ին կետի համաձայն, մինչեւ օրենքն ուժի մեջ մտնելը (16.12.1999թ.) տրված ժամանակավոր արտոնագրերին, որոնց գործողության ժամկետը չի ավարտվել, տրվում է նախնական արտոնագրի իրավական կարգավիճակ, այսինքն գործողության 10 տարի ժամկետ:

Ձեր № 312 A2 արտոնագրի գործողության ժամկետը 16.12.1999թ.-ի դրությամբ չէր ավարտվել, ուստի օրենքի 41-րդ հոդվածի վերը նշված դրույթը տարածվում է Ձեր արտոնագրի վրա, որն ստացել է նախնական արտոնագրի կարգավիճակ, գործողության 10 տարի ժամկետով (մինչեւ 25.02.2007):

Ներկայումս Ձեր № 312 A2 արտոնագիրը գտնվում է գործողության մեջ:

Պետի տեղակալ Ա.Խաչիկյան

375010, Երեւան, Գլխավոր պող., Կառավարական տուն 3
Հեռ. (3741) 563-258. Ֆաքս (3741) 543-467

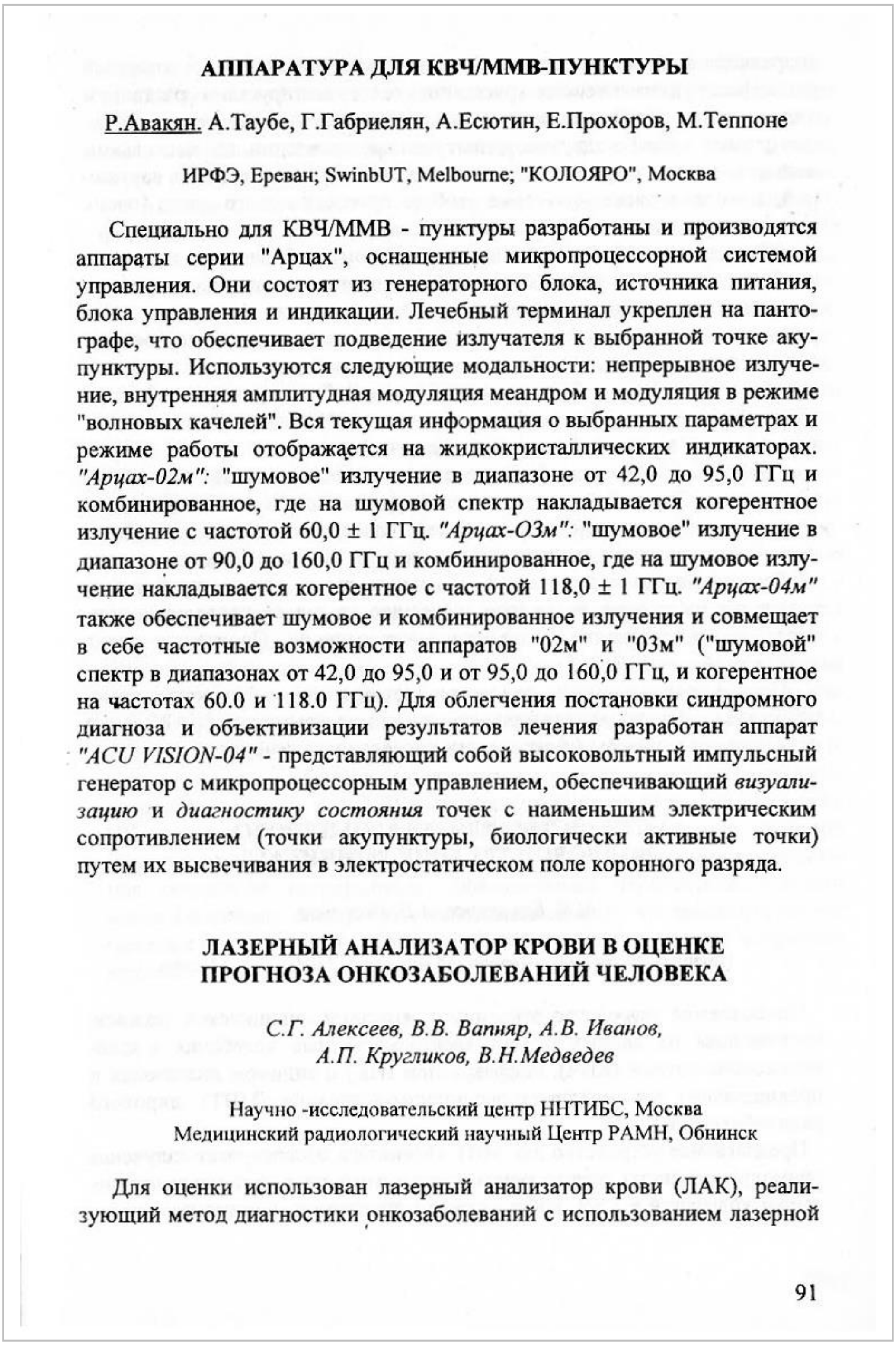
Հաշվարկային հաշիվ No (90001) 1184034
Երեւանի գանձապետական բաժանմունք

Internet: http://www.armpatent.org E-mail: armpat@cornet.am

Аппаратура для КВЧ / ММ – Пунктуры

Р.Авакян, А.Таубе, Г.Габриелян, А.Есютин,
Е.Прохоров, М.Теппоне

Фундаментальные науки и альтернативная медицина
22-25 сентября, 1997, Пущино, (тезисы) с. 91
https://archive.org/details/1997-fundamental-sciences/page/n46/mode/1up



АППАРАТУРА ДЛЯ КВЧ/ММВ-ПУНКТУРЫ

Р.Авакян, А.Таубе, Г.Габриелян, А.Есютин, Е.Прохоров, М.Теппоне

ИРФЭ, Ереван; SwinbUT, Melbourne; "КОЛОЯРО", Москва

Специально для КВЧ/ММВ - пунктуры разработаны и производятся аппараты серии "Арцах", оснащенные микропроцессорной системой управления. Они состоят из генераторного блока, источника питания, блока управления и индикации. Лечебный терминал укреплен на пантографе, что обеспечивает подведение излучателя к выбранной точке акупунктуры. Используются следующие модальности: непрерывное излучение, внутренняя амплитудная модуляция меандром и модуляция в режиме "волновых качелей". Вся текущая информация о выбранных параметрах и режиме работы отображается на жидкокристаллических индикаторах. *"Арцах-02м"*: "шумовое" излучение в диапазоне от 42,0 до 95,0 ГГц и комбинированное, где на шумовой спектр накладывается когерентное излучение с частотой 60,0 ± 1 ГГц. *"Арцах-ОЗм"*: "шумовое" излучение в диапазоне от 90,0 до 160,0 ГГц и комбинированное, где на шумовое излучение накладывается когерентное с частотой 118,0 ± 1 ГГц. *"Арцах-04м"* также обеспечивает шумовое и комбинированное излучения и совмещает в себе частотные возможности аппаратов "02м" и "03м" ("шумовой" спектр в диапазонах от 42,0 до 95,0 и от 95,0 до 160,0 ГГц, и когерентное на частотах 60.0 и 118.0 ГГц). Для облегчения постановки синдромного диагноза и объективизации результатов лечения разработан аппарат *"ACU VISION-04"* - представляющий собой высоковольтный импульсный генератор с микропроцессорным управлением, обеспечивающий *визуализацию* и *диагностику состояния* точек с наименьшим электрическим сопротивлением (точки акупунктуры, биологически активные точки) путем их высвечивания в электростатическом поле коронного разряда.

ЛАЗЕРНЫЙ АНАЛИЗАТОР КРОВИ В ОЦЕНКЕ ПРОГНОЗА ОНКОЗАБОЛЕВАНИЙ ЧЕЛОВЕКА

С.Г. Алексеев, В.В. Вапияр, А.В. Иванов,
А.П. Кругликов, В.Н.Медведев

Научно -исследовательский центр ННТИБС, Москва
Медицинский радиологический научный Центр РАМН, Обнинск

Для оценки использован лазерный анализатор крови (ЛАК), реализующий метод диагностики онкозаболеваний с использованием лазерной

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Программно-аппаратный комплекс «Мидин»

С.Эльмен, О.Бугаев, М.Теппоне, Р.Авакян

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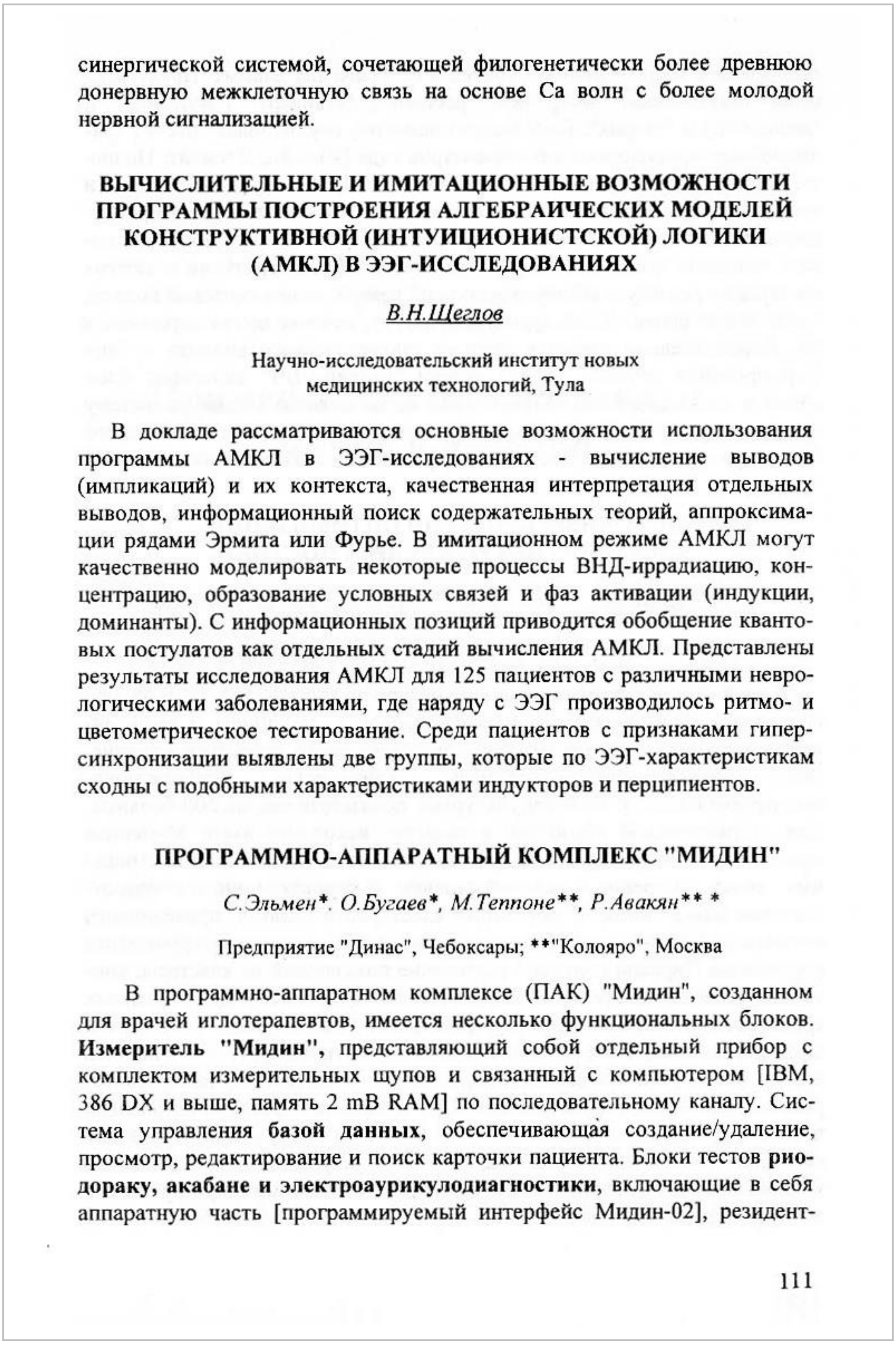

синергической системой, сочетающей филогенетически более древнюю донервную межклеточную связь на основе Са волн с более молодой нервной сигнализацией.

ВЫЧИСЛИТЕЛЬНЫЕ И ИМИТАЦИОННЫЕ ВОЗМОЖНОСТИ ПРОГРАММЫ ПОСТРОЕНИЯ АЛГЕБРАИЧЕСКИХ МОДЕЛЕЙ КОНСТРУКТИВНОЙ (ИНТУИЦИОНИСТСКОЙ) ЛОГИКИ (АМКЛ) В ЭЭГ-ИССЛЕДОВАНИЯХ

В.Н.Щеглов

Научно-исследовательский институт новых
медицинских технологий, Тула

В докладе рассматриваются основные возможности использования программы АМКЛ в ЭЭГ-исследованиях - вычисление выводов (импликаций) и их контекста, качественная интерпретация отдельных выводов, информационный поиск содержательных теорий, аппроксимации рядами Эрмита или Фурье. В имитационном режиме АМКЛ могут качественно моделировать некоторые процессы ВНД-иррадиацию, концентрацию, образование условных связей и фаз активации (индукции, доминанты). С информационных позиций приводится обобщение квантовых постулатов как отдельных стадий вычисления АМКЛ. Представлены результаты исследования АМКЛ для 125 пациентов с различными неврологическими заболеваниями, где наряду с ЭЭГ производилось ритмо- и цветометрическое тестирование. Среди пациентов с признаками гиперсинхронизации выявлены две группы, которые по ЭЭГ-характеристикам сходны с подобными характеристиками индукторов и перципиентов.

ПРОГРАММНО-АППАРАТНЫЙ КОМПЛЕКС "МИДИН"

С.Эльмен. О.Бугаев*, М.Теппоне**, Р.Авакян** **

Предприятие "Динас", Чебоксары; **"Колояро", Москва

В программно-аппаратном комплексе (ПАК) "Мидин", созданном для врачей иглотерапевтов, имеется несколько функциональных блоков. **Измеритель "Мидин",** представляющий собой отдельный прибор с комплектом измерительных щупов и связанный с компьютером [IBM, 386 DX и выше, память 2 mB RAM] по последовательному каналу. Система управления **базой данных**, обеспечивающая создание/удаление, просмотр, редактирование и поиск карточки пациента. Блоки тестов **риодораку, акабане и электроаурикулодиагностики**, включающие в себя аппаратную часть [программируемый интерфейс Мидин-02], резидент-

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ный драйвер и программу обработки и отображения данных. Предусмотрены тематические настройки: "ребенок", "стандарт" ["мужчина" и "женщина"] и "старик". Блок **биоритмологии,** осуществляет расчет традиционных хронологических параметров года [Инь-Ян, Элемент, Полнота-Пустота, "Пять вращений, шесть энергий (Qi)" и др.], дня [бином и временные промежутки] и заданного промежутка времени [пять пропорциональных отрезков "земной ветви"], а также даёт возможность учитывать основные временные запреты на лечение. Блок **стратегии и тактики** терапии реализует общеукрепляющий режим, нозологический подход, синдромный рецепт ТКМ, аурикулопунктуру, лечение по гексаграммам и др. Дополнительно имеются система статистического анализа и блок формирования отчетов. Новые версии "Мидин-КВЧ" включают блок **сбора и анализа жалоб** больного. Все тесты связаны в единую систему диагностики с общей программой расчета, анализа и терапевтического блока, что обеспечивает быстрый и эффективный выбор тактики лечения.

СИСТЕМНЫЕ КРИТЕРИИ ОПТИМИЗАЦИИ ЭЛЕКТРОПУНКТУРНОЙ ДИАГНОСТИКИ

О.Г. Яновский. А.Ф.Бобров, Г.В.Чайкина, Ю.Н.Миронкина.

НИИ традиционных методов лечения Минздрава РФ, Москва

Новый этап в развитии электропунктурной диагностики по Р.Фоллю обусловлен достижениями в области биологии, медицины и вычислительной техники. При проведении контролируемого закрытого клинического исследования получены клинические, лабораторно-инструментальные и электропунктурные показатели свыше 500 больных. Для статистической обработки в качестве исходного взято 80-мерное пространство показателей - абсолютные значения показателей контрольных точек измерения и падений стрелки и корреляционные взаимоотношения между ними. В результате кластерного анализа, проведенного по методу Уорда с использованием в качестве метрики коэффициента корреляции Пирсона получено разделение показателей на кластеры: контрольных точек измерения (КТИ) и падения стрелки(ПС). Для указанных групп показателей был проведен факторный анализ, анализ результатов которого показал, что в каждой из выделенных групп КТИ объединились в один фактор, причем все КТИ коррелируют с соответствующим фактором в практически равной степени. При проведении факторного анализа показатели падения стрелки (ПС) в отличие от КТИ, группируются в два наиболее существенных фактора, причем в результате их свертывания удалось получить специфические паттерны, которые интерпретировали в синдромальных понятиях.

Научный Совет Российской академии наук
по проблеме "Физическая электроника"

Закрытое акционерное общество "МТА-КВЧ"

Институт радиотехники и электроники
Российской академии наук

Всероссийское научно-техническое общество радиотехники,
электроники и связи имени А.С.Попова

Закрытое акционерное общество РЕНТЕХ

Акционерное общество "НПО-Форум"

11 РОССИЙСКИЙ СИМПОЗИУМ С МЕЖДУНАРОДНЫМ УЧАСТИЕМ

МИЛЛИМЕТРОВЫЕ ВОЛНЫ В МЕДИЦИНЕ И БИОЛОГИИ

Сборник докладов

Москва, 1997

АППАРАТЫ СЕРИИ "АРЦАХ" ДЛЯ ММВ/КВЧ-ТЕРАПИИ

Р.Авакян, Г.Габриелян*, А.Грабовщинер**, В.Графов**, М.Теппоне***

*ИРФЭ НАН Армении, 378410, Аштарак-2, Армения
**ПКП ГИТ, Москва, Красноказарменная ул., 14, факс: (095) 362 8492

Крайне высокочастотная (КВЧ) или ММВ терапия является новым методом лечения, основанным на использовании различных биологических эффектов электромагнитного излучения ММ-диапазона длин волн.

В настоящее время можно с уверенностью говорить о существовании трех самостоятельных методиках КВЧ/ММВ-терапии:

1. Микроволновая резонансная терапия (МРТ);
2. Многозональная КВЧ-терапия или КВЧ-пунктура;
3. КВЧ-терапия без индивидуализации частоты ЭМИ и зоны воздействия [1].

Каждая из методик КВЧ/ММВ-терапии требует соответствующую аппаратуру, позволяющую осуществлять воздействие в режиме индивидуально выбранной или фиксированной частот ЭМИ, с амплитудной или частотной модуляциями, свипированием, на область проекции точек акупунктуры или на рефлексогенные зоны пациента.

На базе последних теоретических и экспериментальных исследований была разработана и выпускается серия генераторов ММ ЭМИ "Арцах" [2,3].

Использование ММ ЭМИ в клинической практике показало, что наиболее трудной проблемой МРТ является индивидуализация лечебной частоты, осуществляемая на основании сенсорных реакций пациента [4]. Некоторые из пациентов (дети или пациенты, истощенные длительным хроническим заболеванием) имеют слабовыраженный сенсорный отклик, что может приводить к ошибочному выбору той или другой частоты. Для решения этой проблемы предлагается использование широкополосного шумового излучения, основанное на гипотезе, что организм человека будучи частотно-избирательной системой, сам "выбирает" из всего шумового спектра требуемые ему терапевтические частоты ЭМИ [3]. Это позволяет упростить методику поиска частоты и избежать ошибок в процессе лечения.

Аппараты серии "Арцах" состоят из генераторного терминала, блока управления, питания и индикации. Генераторный терминал с рупорной или диэлектрической стержневой антенной закреплен на пантографе, что позволяет направлять излучение на выбранные точки акупунктуры или рефлексогенные зоны. Предусмотрена работа в режимах непрерывной генерации, внутренней амплитудной модуляции меандром. Аппарат оснащен таймером со звуковой и световой сигнализациями. По истечению заданного времени происходит автоматическое отключение генератора.

"Арцах-02М" имеет два вида излучения: "шумовое" в диапазоне от 42,0 до 95,0 ГГц и комбинированное, где на шумовой спектр накладывается когерентное излучение с частотой 60,0 ± 1 ГГц (одна из линий поглощения молекулярного кислорода).

"Арцах-03М" также имеет два вида излучения: "шумовое" в диапазоне от 90,0 до 140,0 ГГц и комбинированное, где на вышеуказанное шумовое излучение накладывается когерентное с частотой 118,0±1 ГГц (вторая линия поглощения молекулярного кислорода).

"Арцах-04М" (АМАТ-04) - представляет собой прибор с микропроцессорной системой управления двумя выносными лечебными терминалами. Он обеспечивает как широкополосное шумовое излучение, так и когерентное излучение на фиксированных частотах и совмещает в себе частотные возможности аппаратов "02М" и "03М" ("шумовой" спектр в диапазонах от 42,0 до 95,0 и от 95,0 до 140,0 ГГц, соответственно и когерентное на частотах 60.0 и 118.0 ГГц). Предусмотрена возможность внутренней амплитудной модуляции и модуляции в режиме "волновых качелей" в диапазоне частот от 0,1 до 250 Гц. Аппарат оснащен датчиками частоты пульса и дыхания, дающими возможность проведения объективного динамического контроля в процессе лечения (с точки зрения традиционной китайской медицины отношение частоты пульса к частоте дыхания в норме составляет 5, а увеличение или уменьшение указывает на наличие синдрома *Жары* или *Холода*). Вся текущая информация о выбранных параметрах и режиме работы отображается на жидкокристаллических индикаторах.

"ПАКТ-02" (полифакторный аппарат квантовой терапии) представляет собой прибор с микропроцессорным управлением, сочетающий в себе основные действующие физические факторы аппаратов "Арцах" и "МИЛТА": миллиметровое, инфракрасное и красное излучения.

Таким образом, вышеперечисленные технические и сервисные характеристики аппаратов серии "Арцах" значительно расширяют их функциональные возможности и позволяют использовать при любых методиках КВЧ/ММВ-терапии, что подтверждается 10-летним высокоэффективным применением в клинической практике.

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11 Российский симпозиум с международным участием

Миллиметровые волны в медицине и биологии

ПРОГРАММНО-АППАРАТНЫЙ КОМПЛЕКС "МИДИН-КВЧ"

С.Эльман, О.Бугаев, М.Теппоне**, Р.Авакян*

***Предприятие "ДИНАС", 428009 г. Чебоксары, а/я 28**
****140070, Московская обл., Томилино, ул. Пионерская 8-92**

При КВЧ-терапии ведущее значение для повышения эффективности лечения принадлежит индивидуализации зоны/точки воздействия [1]. Синдромный подход традиционной китайской медицины (ТКМ) обеспечивает необходимый выбор точек акупунктуры (ТА) и режим проводимой терапии [2]. Некоторые трудности, возникающие при постановке "восточного" синдромного диагноза врачом, имеющим классическое "западное" медицинское образование, побуждают к разработке аппаратно-компьюторных методов обследования и постановки диагноза ТКМ.

В настоящее время наиболее широко применяются методы Накатани [риодораку] (*Y.Nacatani*, 1950), Акабане (*K.Akabane*, 1962), Фолля (*R.Voll*, 1953), Нечушкина (*А.Нечушкин*, 1974), Нечушкина-Гайдамакиной (*А.Нечушкин и А.Гайдамакина*,1976) и их модификации. Обычно процедуры включают несколько этапов:

А) измерение различных параметров кожи в области проекции определенных ТА: электрокожное сопротивление, температура, чувствительность к температуре и т.д.;

Б) сравнение полученных результатов с имеющейся базой данных, т.е. "коридором нормы";

В) постановка синдромного диагноза ТКМ: Канал/Орган, Полнота-Пустота, Жара-Холод;

Г) формирование лечебных рекомендаций: точки акупунктуры и режим воздействия.

Предлагаемый программно-аппаратный комплекс "Мидин-КВЧ" (ПАК-М) создан для врачей иглорефлексотерапевтов и может быть использован при проведении КВЧ-пунктуры.

Компьютерно-диагностическая система "Мидин-КВЧ" включает следующие блоки:

1. **ИЗМЕРИТЕЛЬ "МИДИН"**, представляет собой отдельный прибор с комплектом измерительных щупов, связанный с компьютером [IBM, 386 DX и выше, память 2 mB RAM] по последовательному каналу. Активное подавление помех и специальные схемотехнические решения интерфейса позволяют получать объективные данные в реальных условиях.

2. Система управления **БАЗОЙ ДАННЫХ** обеспечивает создание/удаление, просмотр и редактирование карточки пациента; поиск по ряду статистически определенных критериев; создание баз данных по определенным критериям; упаковку и оптимизацию поиска в базе данных.

3. Блоки тестов **РИОДОРАКУ** (БТР), **АКАБАНЕ** (БТА) и **ЭЛЕКТРОАУРИКУЛОДИАГНОСТИКИ** (БЭА) включают в себя аппаратную часть [программируемый интерфейс Мидин-02], резидентный драйвер и программу обработки и отображения данных. Режим настройки позволяет производить конфигурирование необходимых пользователю параметров в достаточно широком диапазоне. Изменение измеряемых параметров дает возможность использовать как стандартные методики, так и создавать новые. Драйвер спроектирован таким образом, что пользователь может во время проведения диагностической процедуры изменить порядок исследования точек и многократно повторять исследования в любой точке.

БТР предусматривает три, а **БТА** - четыре тематические настройки: "ребенок", "стандарт" ["мужчина" и "женщина"], "старик" и обработку данных по четырем направлениям: Инь-Ян, 5 элементов, "сань-цзяо" и классический анализ наиболее отклоненного от средней линии канала тела. Программный интерфейс БЭА также позволяет в широких пределах осуществлять настройку электрических параметров прибора.

3. Блок **БИОРИТМОЛОГИИ** (ББР) представляет собой математическую модель традиционной китайской хронометрологии. Производится расчет биохронологических параметров года [Инь-Ян, Элемент, Полнота-Пустота, "Пять вращений, шесть энергий (Qi)", начало и конец 24 сезонов года], дня [бином и временные промежутки] и заданного промежутка времени [пять пропорциональных отрезков "земной ветви"] [3]. Важной функцией ББР является возможность учитывать 4 основных вида запрета [вращение жэнь-шэнь и као-шэнь, запреты на прижигание и кровопускание].

4. Блок **СТРАТЕГИИ** и **ТАКТИКИ** терапии реализует следующие основные методы выбора параметров лечения: общеукрепляющий режим, нозологический подход, синдромный рецепт ТКМ, аурикулопунктура, лечение по гексаграммам и др.

В ***ручном*** режиме пользователь может по своему усмотрению вносить любые коррективы, добавлять и удалять точки из представленного списка или формировать свой собственный рецепт. ***Автоматический*** режим предусматривает выбор точки или зоны воздействия, способ воздействия на ТА [иглоукалывание/КВЧ-пунктура, прижигание, массаж мэй-хуа, кровопускание, классический массаж и банки], метод воздействия [тонизация, торможение, нейтральное воздействие] и время воздействия с учетом принципов хронопунктуры и запретов.

5. Дополнительно имеются СИСТЕМА СТАТИСТИЧЕСКОГО АНАЛИЗА (ССА), БЛОК ФОРМИРОВАНИЯ ОТЧЕТОВ (БФО), СПРАВОЧНАЯ СИСТЕМА (СС), УТИЛИТЫ (У), ДИСПЕТЧЕР (Д) и ТАЙМЕР (Т).

6. Новые версии ПАК "МИДИН-КВЧ" включают БЛОК **СБОРА** и **АНАЛИЗА ЖАЛОБ** больного. Это позволяет на основании жалоб и анамнеза заболевания выделить ведущий синдром ТКМ (острые, хронические и специфические или локальные симптомы), выбрать необходимые ТА и методику воздействия.

Все тесты связаны в единую систему диагностики с общей программой расчета, анализа и терапевтического блока, что обеспечивает быстрый и эффективный выбор тактики лечения.

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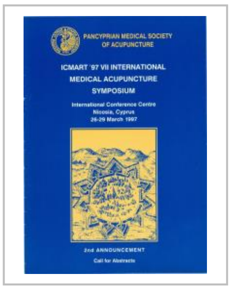
PROGRAMMABLE COMPLEX OF DEVICES "MIDIN - KVCH"

S.Elman, O.Bugaev, M.Teppone, R.Avakian

Programme-apparatus complex "MIDIN - EHF" (PAC-M) has been devised to provide individualization of acupoints and regimen of treatment during EHF-Puncture and Acupuncture. PAC-M is based upon diagnostic methods *Y.Nacatani*, *K.Akabane* and *P.Nogier* (auriculodiagnostic) and includes blocks of Chinese chronotherapy and strategics of treatment. It gives possibility to apply not only classic diagnostic methods but to design new versions of them.



Devices for EHF-Puncture

R. Avagyan, A.Taube, G.Gabrielyn,
A.Grabovtchiner, V.Grafov, M.Teppone

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https://icmart.org/icmart-congress-1997-nicosia-cyprus/devices-for-ehf-puncture/

Extremely High Frequency (EHF) or MM Waves – Therapy, which is based on application of non-thermal electromagnetic radiation (EMR) of millimeter (MM) band, can be divided into three independent branches and every version of EHF-Therapy requires special MM Waves generator. For Microwave Resonance Therapy (MRT) a broad stripe generator – with changeable MM EMR frequency – is necessary.

It also must be able to stimulate sensory reactions on the certain frequency, which is accepted as a «resonance» frequency. For EHF-Puncture generators with coherent or «noise» radiation and with dielectric waveguide usually are applied. Sensory reactions (phenomenon De Qi) must appear during influence upon any selected acupoint. EHF-Therapy without individualization frequency of MM EMR as well as irradiated zone requires generators with horn antenna and fixed frequency.

On the base of theoretical and experimental researches we have devised and manufactured a new series of devices for EHF/MMW-Puncture «Artsakh»: It consists of a generator unit (avalanche diode is used as an active element for generator in all frequency bands), power supply, control and indication unit. Generator unit is mounted on pantograph by means of which the emission may be led to a selected acupoint or zone on the patient’s body. Modes of operation are following: continuous generation, internal meander amplitude- modulation and external modulation.

Automatic switch off for generator is used when the exposition time is over. «Artsakh-01m» has two regimes of emission: coherent frequency with f0 ± 4 GHz, where frequency f0, may lie at any point in the range from 25 to 120 GHz, and «noise» with f0 ± 10 GHz. «Artsakh-02m» also has two regimes of generation: «noise» with frequencies from 42 to 95 GHz and combination of coherent emission (frequency 60.0 ± 1 GHz) and «noise». «Artsakh-03m» has two regimes of generation: «noise» in range of 90.0 – 140.0 GHz and combination “noise» and coherent irradiation (f = 118 ± 1 GHz). «Artsakh-04m» (AMAT-04) is a rnicroprocessor system with the two MM generators.

It ensures two regimes of generation: «noise» with frequencies 42 – 95 and 95 – 140 GHz and combination of coherent emission (frequencies 60.0 and 118.0 GHz) and «noise». Besides, this device has sensors of pulse and breath frequencies, which give possibility of dynamic checking in the process of treatment. «PAQT-02» (polyfactorial apparatus for quantum therapy) presents itself an instrument with microprocessor system and combines in itself different physical factors: MM Waves, Infrared and Red radiation.

The State of the Art of EHF-Puncture Devices

R.Avakian, A.Taube, M.Teppone

International Journal of Acupuncture and Oriental Medicine, 1996, VII, (1-4): 43-44

Abstract: EHF-puncture is a new method of treatment, based on biological effects of low intensive electromagnetic radiation of MM band. This new puncture modality requires special medical generators of MM waves. Authors review different devices which can be applied to carry out various versions of EHF-therapy.

Extremely High Frequency (EHF) Therapy is a new method of treatment which is based on different biological effects of low intensive electromagnetic radiation (EMR) of millimeter (MM) band. Present experience strongly suggests EHF-Therapy can be devided into three independent branches[1]: Microwave Resonance Therapy (MRT),[2,3] Extremely High Frequency (EHF) Puncture[4] and simple Extremely High Frequency (EHF) Therapy.[5]

The formation of these three versions of EHF-Therapy was conditioned be several types of the effects appearing during EHF-influence: specific effects associated with the frequency of MM EMR, nonspecific effects associated with the irradiated zone and non-specific effects conditioned by developing the General adaptation syndrome (GAS).

- Microwave Resonance Therapy (MRT) requires individualization of the therapeutic frequency for every patient or for every disease.
- During EHF-Puncture one needs individualization of irradiated zone-acupoint in accordance with Acupuncture theory of traditional Chinese medicine (TCM).
- The last version of EHF-Therapy does not individualize frequency of EMR as well as irradiated zone.

Every version of EHF-Therapy requires special MM EMR generator:

1) For MRT a broad stripe generator - with changeable MM EMR frequency - is necessary. It also must be able to initiate sensory reactions on the certain frequency, which is accepted as a «resonance» frequency (G4-141, G4-142, Ariya, AMRT, Artsakh, etc.).

2) For EHF-puncture generators with coherent or «noise« radiation and with dielectric waveguide usually are applied. Sensory reactions must appear during influence upon any selected acupoint (G4-141, G4-142, Ariya, AMRT, Electronica-EHF, Artsakh, etc.).

3) EHF-Therapy without individualization frequency of MM EMR as well as irradiated zone requires generators with horn antenna and fixed frequency (Yav-1, Yarmarka, Shlem, Artsakh, Porog, etc.).

«Yav-1» devices are produced in two versions: Yav-1, 7.1 mm and Yav-1, 5.6 mm.[6] The source of emission represents an avalanch-diod (AD) oscillator. Horn antenna (2.0 cm^2 in cross-section) has output power density not less than 10 mw/cm^2.

«Yav-1» device operates in the continuous oscillation mode and frequency modulations used at frequency 50 Hz. Frequency deviation band is over + 80 Mhz.

«Electronica-EHF» is produced having operation frequency f = 61.0 + 2.1 GHz, out put power 5 mW, and may operate both in continuous and pulse oscillation modes.[7] The source of MM emission is AD. It differs from Yav-1 by existence of decoupling devices (ferrite waveguide), isolators and bandpass filters.

«Ariya» device has been developed in 1990.[8] The specific feature of this device is that it includes a waveguide-stripline oscillator manufactured on basis of Indium/Phosphide Gunn diod. Operation frequency band of the device is fo = fc + 4 GHz, where central frequency (fc) may vary within the range from 54.0 to 77.5 GHz. The output power is not less than 1 mW. Three operation modes of emitted signal are possible: continuous mode, frequency modulation mode with frequency deviation band + 50 MHz, and amplitude-modulation mode with frequency modulation in the range from 1 to 100 Hz. Power supply is from a.c. mains, 220 V, and does not exceed 10 W.

Further progress in EHF-Therapy is related with the progress into new frequency bands and functional characteristics of emission devices.

On the base of theoretical and experimental researches we have devised and manufactured a new series of devices «Artsakh».

«Artsakh»: Avalanche diode is used as an active element for generator in all frequency bands, which provides high operating characteristics of «Artsakh».[9] Broadband frequency tuning has become possible due to application of similar AD in the pre-break-down mode.

Application of MRT devices in clinical practice has shown that the most «delicate« problem is determination of resonance therapeutic frequencies, usually based on patients subjective sensor reactions. However there are patients (elderly people, children or persons weakened by chronic disease) whose sensor reactions may be expressed weakly, which may result in errors of therapeutic frequency determination.

In order to overcome this drawback of known devices we have proposed a MRT method in which a solid-state noise generator of MMW is used. Noise emission spectrum of «Artsakh-02M» and «Artsakh-03M» devices covers the frequency bands from 42.0 to 95.0 and 90.0 to 140.0 GHz, respectively.[10]

Since every biological object represents a frequency selective system, it chooses its eigen frequency from the entire noise spectrum. Thus no determination of therapeutic frequency is necessary in this case and we may escape errors.

«Artsakh» device consists of a generator unit, power supply, control and indication unit. Generator unit is mounted on pantograph by means of which the emission may be led to a selected acupoint or zone on the patient's body. Modes of operation are: continuous generation, internal meander amplitude-modulation and external modulation. Automatic switch off for generator is used when the exposition time is over.

«Artsakh-01M» has two regimes of emission: coherent frequency with fo + 4 GHz, where frequency fo may lie at any point in the range from 25 to 120 GHz, and «noise» with fo + 10 GHz.

«Artsakh-02M» also has two regimes of generation: «noise« with frequencies from 42 to 95 GHz and combination of coherent emission (frequency 60.0 + 1 GHz) and «noise».

«Artsakh-03M» has two regimes of generation: «noise» in range of 90.0 - 140.0 GHz and combination «noise« and coherent irradiation (f = 118 + 1 GHz).

Thus all multiservice and multifunctional characteristics of «Artsakh» devices give one possibility to provide them for any versions of EHF-Therapy effectively.

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Arrival of Qi Phenomenon during Extremely High Frequency Therapy

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See # 40

Phenomenon of «De Qi» or Sensory reactions during EHF-Puncture

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See # 43

EHF – Puncture: Integration of East and West Modern Diagnostic & Therapeutic Microwave Equipment.

M.Teppone, R.Avakian, A.J.Scott–Morley

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INTERNATIONAL SYMPOSIUM

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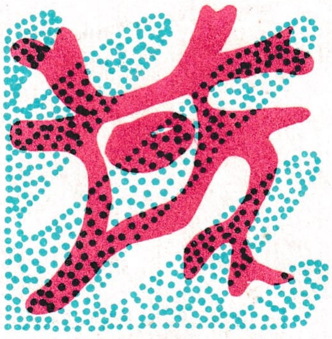

МЕЖДУНАРОДНЫЙ СИМПОЗИУМ

МИЛЛИМЕТРОВЫЕ ВОЛНЫ НЕТЕПЛОВОЙ ИНТЕНСИВНОСТИ В МЕДИЦИНЕ

3–6 октября 1991, Москва

Сборник докладов

Часть 1

ПРИМЕНЕНИЕ МНОГОЗОНАЛЬНОЙ КВЧ-ТЕРАПИИ В ЛЕЧЕНИИ БОЛЬНЫХ С ИБС.СТЕНОКАРДИЕЙ ПОКОЯ И НАПРЯЖЕНИЯ

А.А.Кротенко, М.И.Коновалов, М.В.Теппоне
Временный научный коллектив "КВЧ" АН СССР
СССР I2I002 Москва, пер. Вахтангова 4

Реферат. Многозональная КВЧ-терапия, основанная на синдромном подходе Традиционной Китайской Медицины /ТКМ/, позволяет получить положительный эффект при лечении больных с ИБС.Стенокардией покоя и напряжения.

Введение. Микроволновая терапия является новым методом воздействия на организм человека, основанном на использовании низкоинтенсивного электромагнитного излучения /ЭМИ/ миллиметрового /ММ/ диапазона /I-4/. Поскольку области кожной проекции точек акупунктуры обладают высокой чуствительностью к ММ ЭМИ /5/ мы использовали синдромный подход ТКМ для выбора зон воздействия при проведении КВЧ-терапии ИБС.Стенокардии покоя и напряжения.

Результаты и обсуждение. Нами проведено лечение I5 мужчин в возрасте 43-45 лет с длительностью заболевания от 2 до I0 лет. У 6 пациентов в анамнезе был инфаркт миокарда. Явлений сердечной недостаточности и нарушений ритма среди пациентов не отмечалось. Класс тяжести определялся на основе Канадской классификации /6/: II ф.к.-4 человека, III ф.к.-8 человек, IУ ф.к.-3 человека. Трое пациентов имели в анамнезе полостные операции.

С точки зрения ТКМ клиника стенокардии развивается на фоне следующих синдромов: "Пустота Лёгких", "Пустота Почек", прежде всего "Инь Почек" и "Полнота Ян Печени" /7,8/.

Лечение заключалось в регулировании "Чи Лёгких и Почек" на основе принципов Шу-Мо терапии /7,8/. Если во время лечения у больного появлялась клиника,соответствующая нарушению одного из шести слоёв или возникали нарушения в главных меридианах и вторичных сосудах, то в этом случае производилось лечение нарушений в органах. За время проведения одной процедуры использовалось от 2-3 до 5-6 точек акупунктуры. Длительность воздействия на область проекции точки акупунктуры зависила от того, что требовалось получить: для возбуждения 2-5 минут, а для торможения I5-20 минут.

Лечение осуществлялось в амбулаторных условиях. Во время проведения курса микроволновой терапии пациенты продолжали принимать антиангинальную терапию. Процедуры проводились I-2 раза в неделю. Продолжительность курса составляла 6 месяцев.

Источником ЭМИ ММ диапазона был генератор Г4-I42. Лечение осуществлялось на фиксированной частоте 53,53 ГГц /длина волны: 5,6 мм/, выходная мощность не более 0,I мВт.

Для оценки эффективности лечения проводилась Велоэргометрическая /ВЭМ/ проба.

Критерии эффективности были следующими:

"Значительное улучшение": После проведённого лечения у больного отмечалось уменьшение количества приступов стенокардии, снижение доз антиангинальных препаратов и увеличение толерантности к физическим нагрузкам на одну ступень и выше по ВЭМ.

"Улучшение": Временное уменьшение количества приступов стенокардии без улучшения показателей ВЭМ.

"Без эффекта": В течении 2 месяцев от начала лечения количество приступов стенокардии не уменьшалось и при проведении ВЭМ не было увеличения толерантности.

Во время проведения сеансов у пациентов возникали различные сенсорные реакции, характеризуемые в ТКМ как феномен "Де Чи" /9,I0/. Приемущественно отмечались "канальные и органные" сенсорные реакции. Наиболее подробно хотелось бы остановиться на "цветовых" типах "Де Чи", возникающих при торможении Мо-точек. До включения генератора все пациенты "видели" перед закрытыми глазами обычный цвет, который бывает, когда человек закрывает глаза. Во время проведения процедуры большинство пациентов отмечали изменение цветового фона: появление разноцветных пятен, а также "выход различных цветов" из тела и из точки над переносицей. Чаще всего в начале лечения виден выход чёрного, серого, фиолетового цветов. В дальнейшем- появление зелёного, жёлтого, оранжевого цветов или их сочетаний. По мере удаления этой цветовой гаммы, видимые поля зрения заполнялись синим, голубым, розовым, солнечным цветами имеющими "чистые", "приятные" оттенки.

Результаты лечения были следующими:

- "значительное улучшение" у 4 /26,6%/ человек
- "улучшение" у 6 /40,0%/ человек
- "без эффекта" у 5 /33,4%/ человек

Было замечено:

В группах с положительным эффектом все пациенты отмечали сенсорные реакции. Наиболее выраженными они были в группе со "значительным улучшением".

В группе "без эффекта" пациенты практически не имели сенсорных реакций. В эту же группу вошли все пациенты имеющие в анамнезе полостные операции.

Таким образом:

I/ Многозональная КВЧ-терапия, основанная на синдромном подходе ТКМ, позволяет получить положительный эффект при лечении ИБС.Стенокардии покоя и напряжения.

2/ Сенсорные реакции, возникающие во время проведения КВЧ-терапии, являются благоприятным прогностическим критерием.

3/ По нашим наблюдениям наличие в анамнезе полостных операций является фактором, отрицательно влияющим на эффективность КВЧ-терапии.

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2. Миллиметровые волны в медицине и биологии /Под ред. Н.Д. Девяткова.-М.:ИРЭ АН СССР, I989.- 307 с.
3. Применение миллиметрового излучения низкой интенсивности в биологии и медицине /Под ред. Н.Д.Девяткова.- М.:ИРЭ АН СССР, I985.- 284 с.
4. Применение КВЧ излучения низкой интенсивности в биологии и медицине: Тез. докл. УII Всесоюз. семинара.- М, I989.- I64 с.
5. Андреев Е.А., Белый М.У., Ситько С.П. //3/-С. 58-83.
6. Стенокардия. Под ред. Д. Джулиана: Пер. с англ.: Медицина, I980.- 336 с.
7. Chamfrault A., Nghi N.V.: Traité de Médecine Chinoise: L'energétique humaine en Médecine chinoise. Coquemard, Angouleme, 1969.-V. 6.- 463 p.
8. Nghi N.V.: Pathogenese und Pathologie der Energetik in der Chinesischen Medicine: Behandlung durch Akupunktur und Massage.- Uelzen, 1974 - Bd. 1

9. Chamfrault A.: Traité de Médicine Chinoise: Acupuncture-Massages-Saignées. Coquemard, Angouleme, 1954.-V.1- 986 p.

10. Teppone M.: Therapeutic Effect of EHF-Puncture on Gastric Polyps: Clinical Analysis of Eleven Cases // American Journal of Acupuncture, 1991.-V. 19.-N 1.- P. 11-15

SUMMARY

Polyzone EHF - Therapy in Treatment of Coronary Heart Disease, Angina Pectoris

A.A.Krotenko, M.I. Konovalov, M.V.Teppone
Science Corporation "EHF"
4 Vakhtangov st. Moscow, 121002 USSR

Extremely High Frequency (EHF)-therapy is a new therapeutic method based on application of different biological effects of Microwaves.

We tried EHF-therapy while treating patients of Angina Pectoris. Irradiated zones-acupoints were selected in accordance with acupuncture theory of Traditional Chinese Therapy.

Results of treatment were as follows:
"Significant Improvement" was in 26,6 % cases
"Improvement" was in 40,0 % cases
"Without Improvement" was in 33,4 % cases

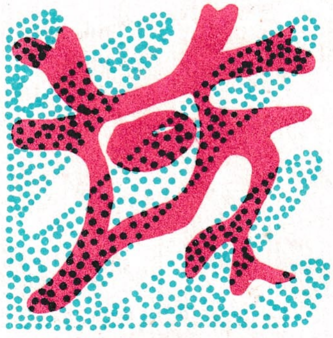
INTERNATIONAL SYMPOSIUM

MILLIMETER WAVES OF NON-THERMAL INTENSITY IN MEDICINE

Oct. 3–6 1991, Moscow

Digest of Papers

Part 1



МЕЖДУНАРОДНЫЙ СИМПОЗИУМ

МИЛЛИМЕТРОВЫЕ ВОЛНЫ НЕТЕПЛОВОЙ ИНТЕНСИВНОСТИ В МЕДИЦИНЕ

3–6 октября 1991, Москва

Сборник докладов

Часть 1

ПРИМЕНЕНИЕ МНОГОЗОНАЛЬНОЙ КВЧ-ТЕРАПИИ В ЛЕЧЕНИИ БОЛЬНЫХ С ПАНИЧЕСКИМИ АТАКАМИ

А.А.Кротенко, Е.П.Петрова, М.В.Теппоне
Временный научный коллектив "КВЧ" АН СССР
СССР I2I002 Москва, пер. Вахтангова 4

Реферат. КВЧ-терапия основанная на синдромном подходе Традиционной Китайской Медицины /ТКМ/ позволяет получить прекращение или урежение панических атак, что сопровождается улучшением показателей Электроэнцефалограммы /ЭЭГ/.

Введение. Работы последних лет показывают высокую эффективность КВЧ-терапии, основанной на синдромном подходе ТКМ, в лечении различных заболеваний /I-3/. Это позволило нам использовать данный метод при лечении панических атак.

Под термином панические атаки американская синдромологическая классификация DSM -3 объединяет вегетативные кризы ранее описываемые в специальной литературе как ваговазальные кризы Говерса, симпатические кризы Баре, смешанные кризы Польцера /4-9/.

Результаты и обсуждение. Нами проведено лечение I0 больных: 6 женщин и 4 мужчин в возрасте от 20 до 63 лет. Психовегетативный синдром явился проявлением различных заболеваний: у 2 пациентов паническая атака развилась на фоне дисциркуляторной энцефалопатии, у 4 как отдалённые последствия черепно-мозговой травмы, у 3 на фоне патологического климакса и у одной больной на фоне рассеянного склероза.

Паническая атака проявлялась следующими синдромами ТКМ/I0,II/

- 6 пациентов с синдромом "Шао Янь"
- 2 пациентов с синдромом "Цзюе Инь": тип "смешанный "Инь/Янь"
- 2 пациентов с поражением "чудесного меридиана Ян Ое, сегмент затылок".

В лечении использовались точки: 42Е, 58У, 2RP, 6RP, I5УG,I6УG, 20УВ, 34УВ, 9Р.

Лечение осуществлялось в период нахождения больных в стационаре, во время обострения заболевания. Процедуры проводились ежедневно или через день, в среднем за курс выполнялось от 2-3 до 5-6 процедур. Длительность процедуры зависила от того, что требовалось получить: тонизацию или рассеивание акупунктурной точки. Для тонизации требовалось 2-5 минут, а для рассеивания I5-20 минут. Во время лечения лекарства и физиотерапию не назначали.

Источником электромагнитного излучения миллиметрового диапазона был генератор Г4-I42. Лечение осуществлялось на фиксированной частоте 53,53 ГГц /длина волны: 5,6мм/, выходная мощность не более 0,I мВт.

Для объективизации полученных результатов проводился компрессивный спектральный анализ ЭЭГ на Берг-Фурье анализаторе OTE BIOMEDICA /Италия/.

Критерии оценки эффективности были следующие:

"Значительное улучшение": прекращение или урежение параксизмов, сопровождаемое повышением быстроволновой активности, снижением медленноволновой активности и ростом частотного индекса: $\frac{\alpha + \beta}{\delta + \theta}$ при проведении ЭЭГ.

"Улучшение": прекращение или урежение параксизмов без улучшения ЭЭГ.

"Без эффекта": отсуствие улучшения клиники и ЭЭГ.

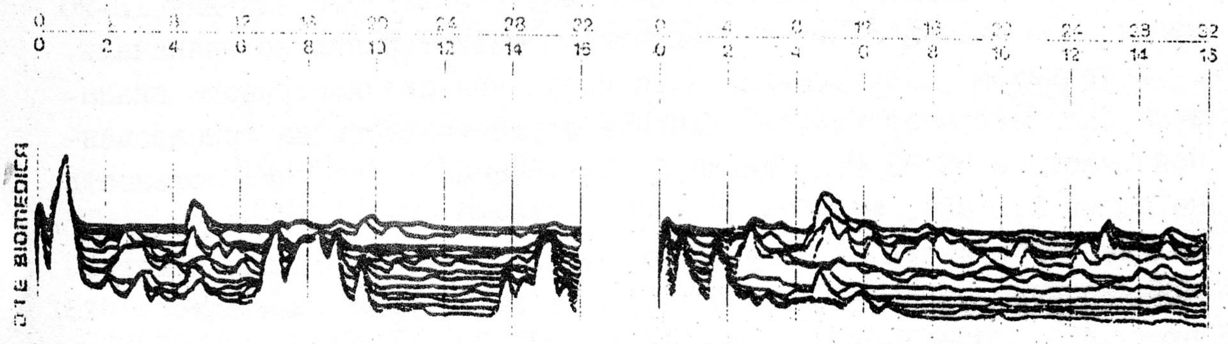
Во время проведения процедуры у пациентов отмечались различные сенсорные реакции, описываемые в ТКМ как феномен "Де Чи" /I-3/. Приемущественно отмечались "канальные" и "органные" сенсорные реакции.

Результаты лечения были следующими:

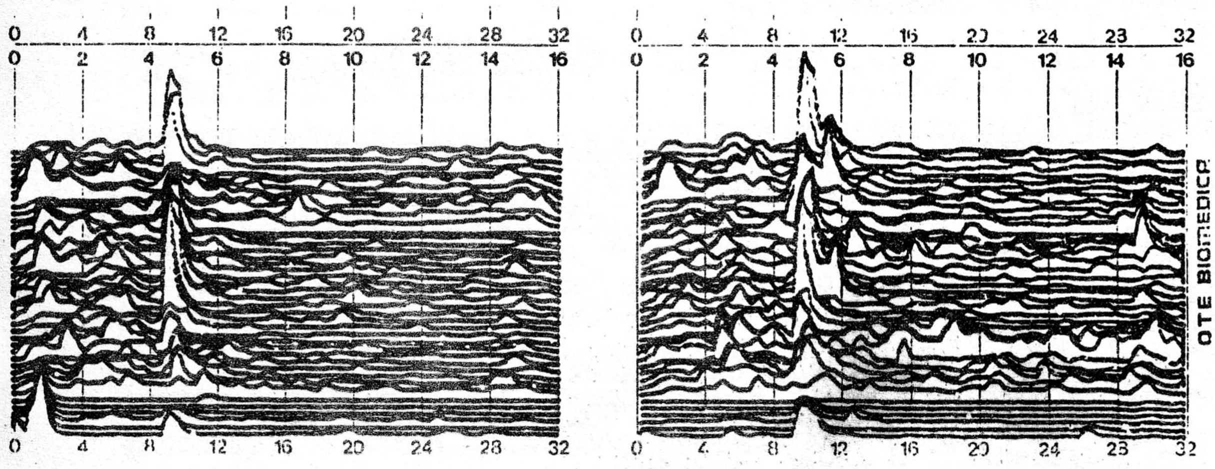
- "значительное улучшение": 6 /60%/ человек
- "улучшение": 2 /20%/ человека
- "без эффекта": 2 /20%/ человека

При этом надо отметить, что в группе со "значительным улучшением" альфа-ритм возрос в основном за счёт быстроволновой части спектра и приемущественно повышалась активность правого полушария. У одного пациента с бездоминантным типом ЭЭГ на фоне КВЧ-терапии появился альфа-ритм. В группе "без эффекта" оказались все пациенты с дисциркуляторной энцефалопатией.

Клинический пример: Больная М. 20 лет. Панические атаки начались через два года после черепно-мозговой травмы. Клинически проявлялись синдромом "Шао Янь". После проведения трёх процедур кризы прекратились. Это сопровождалось улучшением ЭЭГ.



ЭЭГ до начала лечения



ЭЭГ после проведения трёх процедур

На основе полученных результатов можно предположить:

I/ КВЧ-терапия основанная на синдромном подходе ТКМ позволяет получить прекращение или урежение панических атак, что сопровождается улучшением показателей ЭЭГ: стабилизация альфа-ритам, снижение медленноволновой активности.

2/ Происходит активация электрической активности приемущественно правого полушария,и в основном, за счёт быстроволновой части спектра альфа-ритма.

3/ Сенсорные реакции, возникающие во время проведения процедур, являются благоприятным прогностическим критерием.

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SUMMARY

A.Krotenko, E.Petrova, M.Teppone

POLYZONE EHF-THERAPY OF PANIC ATTACKS

Science Corporation "EHF"
4 Vakhtangov st. Moscow, 121002 USSR

EHF-therapy, which is based on Acupuncture theory of Traditional Chinese Medicine, provides not only clinical improvements but also positive changing the EEG of Panic Attacks patients.

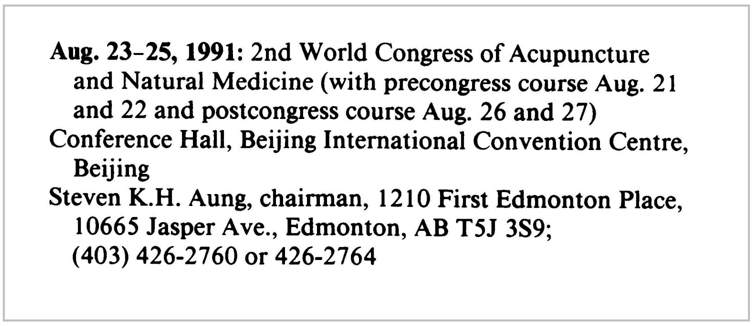
There was noticed stabilization of the alpha-rhythm, increase of electrical action of the right cerebral hemisphere, mainly, due to quick waves of alpha-rhythm and decrease of slow waves action.

Sensory reactions appeared during the procedures of EHF-therapy are favourable prognostic criterion.

Extremely High Frequency Puncture of Coronary Heart Disease (Angina Pectoris)

A.Krotenko, M.Teppone

The 2nd World Congress of Medical Acupuncture and Natural Medicine
August 21-27, 1991, Beijing, China (abstracts), p. 46



Aug. 23–25, 1991: 2nd World Congress of Acupuncture and Natural Medicine (with precongress course Aug. 21 and 22 and postcongress course Aug. 26 and 27)
Conference Hall, Beijing International Convention Centre, Beijing
Steven K.H. Aung, chairman, 1210 First Edmonton Place, 10665 Jasper Ave., Edmonton, AB T5J 3S9;
(403) 426-2760 or 426-2764

See # 119

Применение многозональной КВЧ-терапии в лечении больных с ИБС, Стенокардией напряжения.

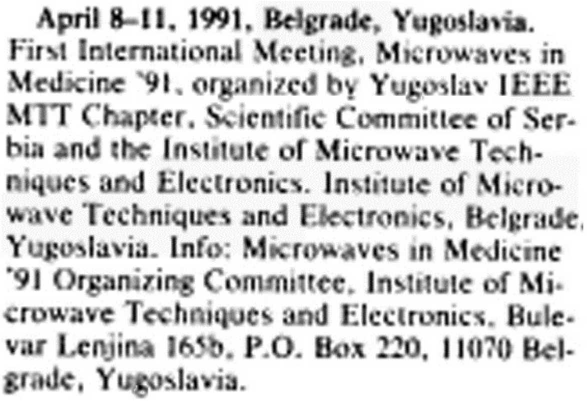
А.Кротенко, М.Коновалов, М.Терроне

Миллиметровые волны нетепловой интенсивности в медицине
Международный симпозиум, 3-6 октября, 1991, Москва, Россия (сб. докл.), с. 105−108
https://archive.org/details/1991-congress-1/page/105/mode/1up

Microwaves in Treatment of Coronary Heart Disease (Angina Pectoris)

A.Krotenko, M.Teppone

Microwaves in Medicine 1991: International Scientific Meeting
April 8-11, 1991, Belgrade, Yugoslavia (Digest of Papers), p. 213-217

 **April 8–11, 1991, Belgrade, Yugoslavia.** First International Meeting, Microwaves in Medicine '91, organized by Yugoslav IEEE MTT Chapter, Scientific Committee of Serbia and the Institute of Microwave Techniques and Electronics. Institute of Microwave Techniques and Electronics, Belgrade, Yugoslavia. Info: Microwaves in Medicine '91 Organizing Committee, Institute of Microwave Techniques and Electronics, Bulevar Lenjina 165b, P.O. Box 220, 11070 Belgrade, Yugoslavia.	**April 8-11. 1991, Belgrade, Yuguslavia.** First International Sleeting, Microwaves in Medicine '91, organized by Yugoslav IEEE MTT Chapter, Scientific Committee of Serbia and the Institute of Microwave Techniques and Electronics, Institute of Microwave Techniques and Electronics, Belgrade, Yugoslavia. Info: Microwaves in Medicine '91 Organizing Committee. Institute of Microwave Techniques and Electronics. Bulevar Lenjina 165b. P.O. Box 220, 11070 Belgrade, Yugoslavia.

Meeting Calendar. – In: *Aviation, Space and Environmental Medicine*, 1991, 62(1): 280

See # 119

Применение многозональной КВЧ-терапии в лечении больных с ИБС, Стенокардией напряжения.

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Международный симпозиум, 3-6 октября, 1991, Москва, Россия (сб. докл.), с. 105−108
https://archive.org/details/1991-congress-1/page/105/mode/1up

Participations at the Congresses with presentation of reports or equipment

1. Application of low intensity EHF-radiation in biology and Medicine. The 7th All Union seminar, November 13-15, 1989, Zvenigorod, Moscow, Russia.
2. Microwaves in Medicine 1991: International Scientific Meeting, April 8-11, 1991, Belgrade, Yugoslavia.
3. World Congress on Medical Physics and Biomedical Engineering, July 7-12, 1991, Kyoto, Japan.
4. The 2nd World Congress of Medical Acupuncture and Natural Medicine, August 21-27, 1991, Beijing, China.
5. Millimeter Waves of Non-Thermal Intensity in Medicine. International Symposium, October 3-6, 1991, Moscow, USSR.
6. The VI Romanian International Congress of Acupuncture, November 6-9, 1991, Bucharest, Romania.
7. The 1st Congress of the European Association of Acupuncture, October 6-9, 1994, Chishinew, Moldova.
8. Millimeter Waves in Medicine and Biology. The 10th Russian Symposium with Foreign Scientists, April 24-26, 1995, Moscow.
9. The 3rd World Congress of Medical Acupuncture and Natural Medicine, August 8-12, 1995, Edmonton, Canada.
10. The 3rd International Congress of Chinese Medicine & Acupuncture, November 18-19, 1995, Singapore.
11. Trans Black Sea Region Symposium on Applied Electromagnetism. – Hellas, Greece, Greece, 17-19 April, 1996.
12. The 3rd International Conference of Integrated Medicine (ICIM), September 13-15, 1996, Los Angeles, USA.
13. The 3rd All-Russian Scientific and Practical Conference on Quantum Medicine. December 17-20, 1996, Moscow, Russia.
14. ICMART '97 VII International Medical Acupuncture Symposium, Nicosia, Cyprus, March 26-29, 1997.
15. Millimeter Waves in Medicine and Biology. The 11th Russian Symposium with Foreign Scientists, April 21-24, 1997, Zvenigorod, Moscow, Russia.
16. «ACUPUNCTURE WHITE NIGHTS», Second European Congress, May 27-30, 1997, Saint Petersburg, Russia.
17. Fundamental (Basic) Sciences and Alternative Medicine. First International Symposium. Sept 22-25, 1997, Pushchino, Russia.
18. The 5th International Baltic Congress on Medical Acupuncture and Related Techniques, Jurmala, May 28-31, 1998.
19. V All-Russian Conference on Quantum Medicine, Dec 8-11, 1998, Moscow, Russia.
20. Theoretical and clinical aspects of the use of bio-resonance and multi-resonance therapy; V International Conference. – April 16-18, 1999, Moscow, Russia.
21. ICMART '99 International Medical Acupuncture Symposium, Riga, May 21-23, 1999.
22. The 5th International Congress of Traditional Medicine & Acupuncture, Singapore, March 18-19, 2000.
23. «The 9th World Congress on Medical Acupuncture and Related Techniques»: ICMART 2000, Vienna, Austria, May 11-14, 2000.
24. The 1st International Symposium «Quantum Medicine and New Medical Technologies», November 17-22, 2001, Bled, Slovenia.
25. «What's new in Physiotherapy – 2003», 6-7 September, 2003, Beirut, Lebanon,
26. Millimeter Waves in Medicine and Biology. The 13th Russian Symposium with Foreign Scientists, December 1-3, 2003, Zvenigorod, Moscow, Russia.

27. Theoretical and clinical aspects of Bio-resonance and multi-resonance therapy application: X International Congress, April 16-18, 2004, Moscow, Russia.
28. «Days of Moscow in Seoul», April 21-24, 2004, Seoul, South Korea.
29. The 5th International Congress of Medical & Cosmetic Acupuncture-Acupressure. 3-6 December 2004, Aurangabad, India.
30. The 11th International Scientific and Practical Conference on Quantum Medicine; New Medical Technologies and Quantum Medicine. January 24-27, 2005, Moscow, Russia.
31. Russian–Chinese Seminar on the Collaboration in the High Technology, March 17-18, 2005, Beijing, China.
32. The Third International Congress of Traditional Medicine, September, 20-22, 2006, Toronto, Canada.
33. AAOM: 2006 International Conference & Exposition, October 20-22, 2006, Phoenix, AZ, USA.
34. IN-CAM Mini-Symposium – CAM Research: from Experience to Evidence, February 2, 2007, McGill University.
35. «Traditional Medicine – 2007», March 1-3, 2007, Moscow, Russia.
36. «Millimeter Waves in Medicine and Biology», 14th Russian Symposium with the Participation of Foreign Scientists, April 2-5, 2007, Moscow, Russia.
37. The AAAOM 25th Anniversary International Conference and Exposition 2007: Portland, Oregon, Portland Hilton, October 18-22, 2007.
38. 2007 North American Conference on Natural Medicine, November, 25, 2007, Kingbridge Center, ON.
39. 20th Annual Symposium for Medical Acupuncture. April 11-13, 2008, Washington, DC, USA.
40. 1st International Conference on Integrative, Complementary and Alternative Medicine (ICAM) and Mental Health May 23 - May 25, 2008, Toronto, Ontario, Canada.
41. 2008 International Conference on Integrative Medicine, October 19, 2008, Hilton Garden Hotel, Vaughan, Ontario, Canada.
42. CSCMA: New Century International TCM and Technology Forum, October 20, 2008. Scarborough, Ontario, Canada.
43. NUPATH: 2008 Annual Regional Conference, November 8-9, 2008, Crown Plaza Hotel - Toronto Airport, Mississauga, Ontario, Canada
    etc.

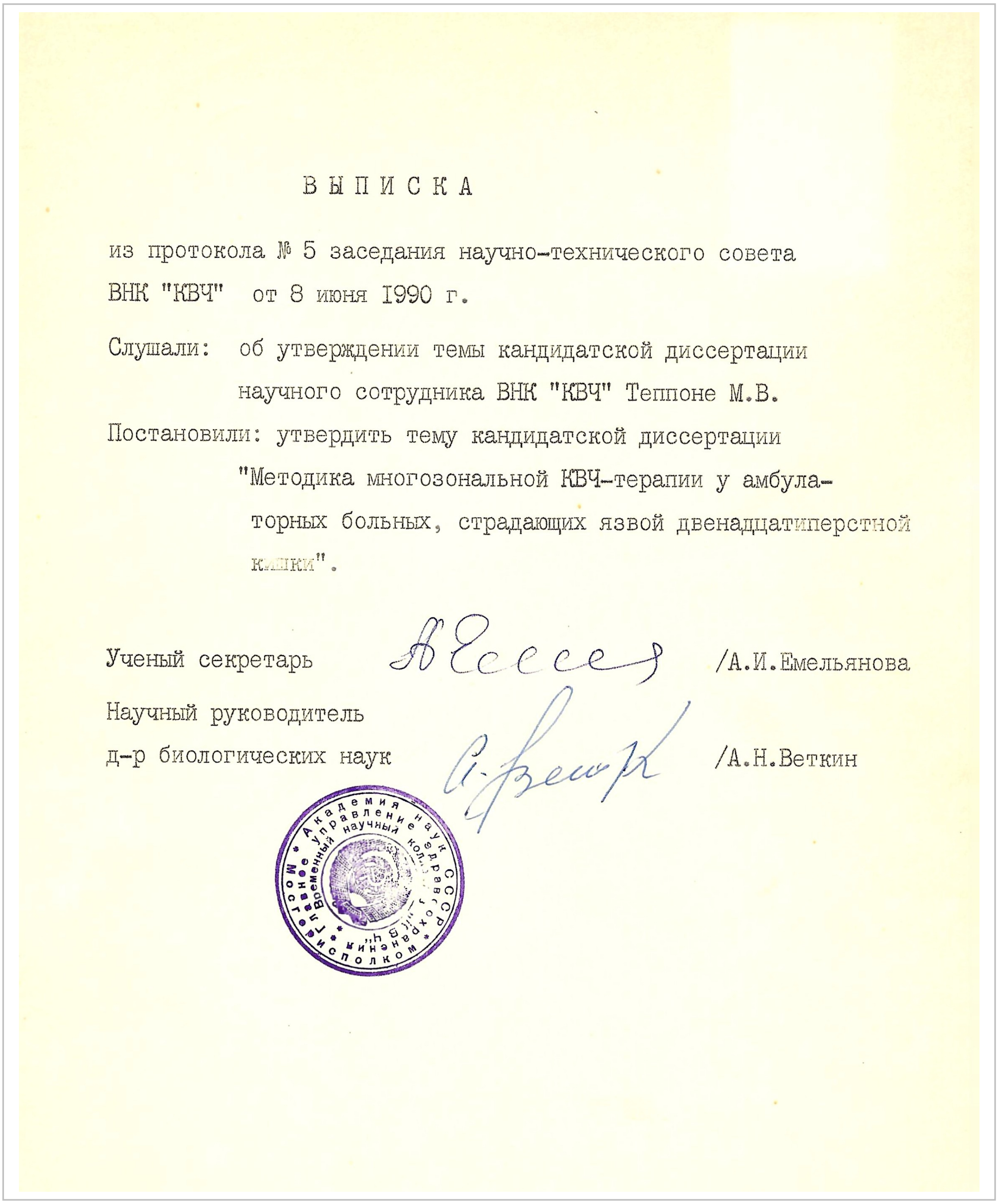
Dr. Mikhail Teppone was awarded

- a Diploma of the World Association of Chinese Medicine «Bring Chinese Medicine Benefit to Angel of All Mankind» (Singapore, 1995);
- a Golden Medal for the outstanding contributing to the Integrative Medicine (Los Angeles, 1996);
- a Diploma for Recognition of the Continuous Effort & Contribution to Medical Acupuncture (Singapore, 2000), and
- a Golden Needle Award (Aurangabad, 2004).

Since 2012, Dr. Teppone took part at various Conferences and Exhibitions dealing with the fields of Anti-aging medicine and Organotherapy, including:

44. In 2012: May – Kuala Lumpur; July – Macao; August – Dalian; September – Bangkok, Singapore, Guan Zhou; October – Shang Hai, Beijing, St. Galen; November - Baden Baden, Ho Chi Minh; December - Las Vegas, Amsterdam.
45. In 2013: Limburg, London (UK); Denpasar-Bali (Indonesia); Manial (Philippines), etc.
46. Managing Cardio – Diabesity – Exploring New Frontiers. The Second International Congress of Regenerative, Anti-Aging & Aesthetic Medicine. – January 31 – February 2, 2014, Cadade de Goa, Goa, India.
47. Wellness of the New Age' Symposium. - February 21, 2014, Kota Kinabalu Chamber of Commerce and Industry (KKCCI), Lot A, 9th Floor, Wisma Pendidikan, Merdeka, Jalan Padang, 88000 Kota Kinabalu, Sabah.
48. 11th Malaysian Conference and Exhibition on Anti-Aging, Aesthetic and Regenerative Medicine & 4th International Congress on Anti-Aging, Aesthetic and Regenerative Medicine. – May 2-4, 2014, JW Marriot, Kuala Lumpur, Malaysia.
49. PAAAMMI Annual Convention 2014: - September 2, 2014, Crown Plaza Manila Galleria Hotel, Quezon City, Philippines.
50. Regenerative Dermatology Course. – March 18, 2015, Microtel by Windham, UP; Technohub, Quezon City, Philippines.
51. PAAAMMI 3rd Annual Convention 2015. - September 2, 2015, Manila Hotel, Manila Philippines.
52. PAAAMMI 4th Annual Convention 2016. - September 16, 2016, New World Manila Bay Hotel, Manila Philippines.
53. Scientific Forum "Reversing Time with Latest Biological, Preventive & Anti-Aging Medicine". – December 19, 2016, Hotel InterContinental, MidPlaza, Jakarta.
54. Inaugural World Congress in Anti-Aging, Aesthetic, Regenerative, Nutritional and Exercise Medicine (WAAARNEM), in conjunction with the 14th Malaysian Conference and Exhibition & 7th International Congress on Anti-Aging, Aesthetic and Regenerative Medicine. – April 28-30, 2017, Sheraton Imperial Kuala Lumpur, Malaysia.
55. International Medical Aesthetic Conference & Exhibition (IMACE 2018). – August 4-5, 2018, Kuala Lumpur Conventional Centre (KLCC), Malaysia.
56. 3rd World Congress on Anti-Aging, Aesthetic, Regenerative, Nutritional and Exercise Medicine (WAAARNEM), in conjunction with the 16th Malaysian Conference and Exhibition & 9th International Congress on Anti-Aging, Aesthetic and Regenerative, Medicine. – April 26-28, 2019, Sheraton Imperial Kuala Lumpur, Malaysia.
57. Inaugural International MAAFIM Conference, Jan 10-12, 2020; Dorset Grand Subang, Subang Jaya, Selangor, Malaysia.

etc.



ВЫПИСКА

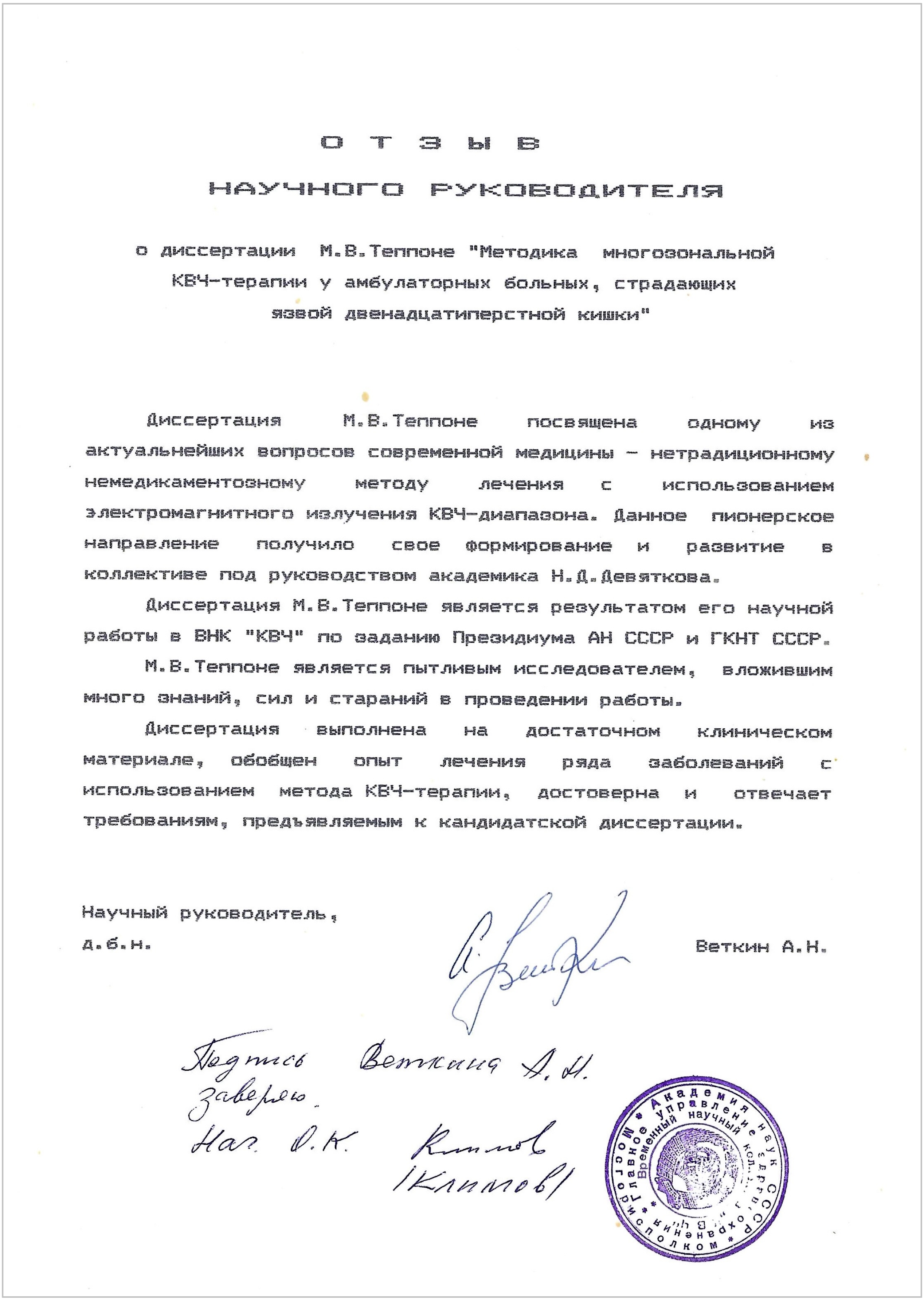
из протокола № 5 заседания научно-технического совета ВНК "КВЧ" от 8 июня 1990 г.

Слушали: об утверждении темы кандидатской диссертации научного сотрудника ВНК "КВЧ" Теппоне М.В.

Постановили: утвердить тему кандидатской диссертации "Методика многозональной КВЧ-терапии у амбулаторных больных, страдающих язвой двенадцатиперстной кишки".

Ученый секретарь /А.И.Емельянова

Научный руководитель
д-р биологических наук /А.Н.Веткин



ОТЗЫВ

НАУЧНОГО РУКОВОДИТЕЛЯ

о диссертации М.В.Теппоне "Методика многозональной
КВЧ-терапии у амбулаторных больных, страдающих
язвой двенадцатиперстной кишки"

Диссертация М.В.Теппоне посвящена одному из актуальнейших вопросов современной медицины - нетрадиционному немедикаментозному методу лечения с использованием электромагнитного излучения КВЧ-диапазона. Данное пионерское направление получило свое формирование и развитие в коллективе под руководством академика Н.Д.Девяткова.

Диссертация М.В.Теппоне является результатом его научной работы в ВНК "КВЧ" по заданию Президиума АН СССР и ГКНТ СССР.

М.В.Теппоне является пытливым исследователем, вложившим много знаний, сил и стараний в проведении работы.

Диссертация выполнена на достаточном клиническом материале, обобщен опыт лечения ряда заболеваний с использованием метода КВЧ-терапии, достоверна и отвечает требованиям, предъявляемым к кандидатской диссертации.

Научный руководитель,
д.б.н. Веткин А.Н.

Подпись Веткина А.Н.
заверяю.
Нач. О.К. Климов
/Климов/

АКАДЕМИЯ НАУК СССР
ГОСУДАРСТВЕННЫЙ КОМИТЕТ СССР ПО НАУКЕ И ТЕХНИКЕ
ГЛАВНОЕ УПРАВЛЕНИЕ ЗДРАВООХРАНЕНИЯ г. МОСКВЫ

ВРЕМЕННЫЙ НАУЧНЫЙ КОЛЛЕКТИВ «КВЧ»

от 05.09.90 № 01-127/9.90

Ректору ЦОЛИУВ
Гаврюшову В.В.

Руководство, партийная и профсоюзная организации ВНК "КВЧ" направляют Вам работу Теппоне М.В. "Методика многозональной КВЧ-терапии у амбулаторных больных, страдающих язвой двенадцатиперстной кишки", представляемую к защите на соискание ученой степени кандидата медицинских наук.

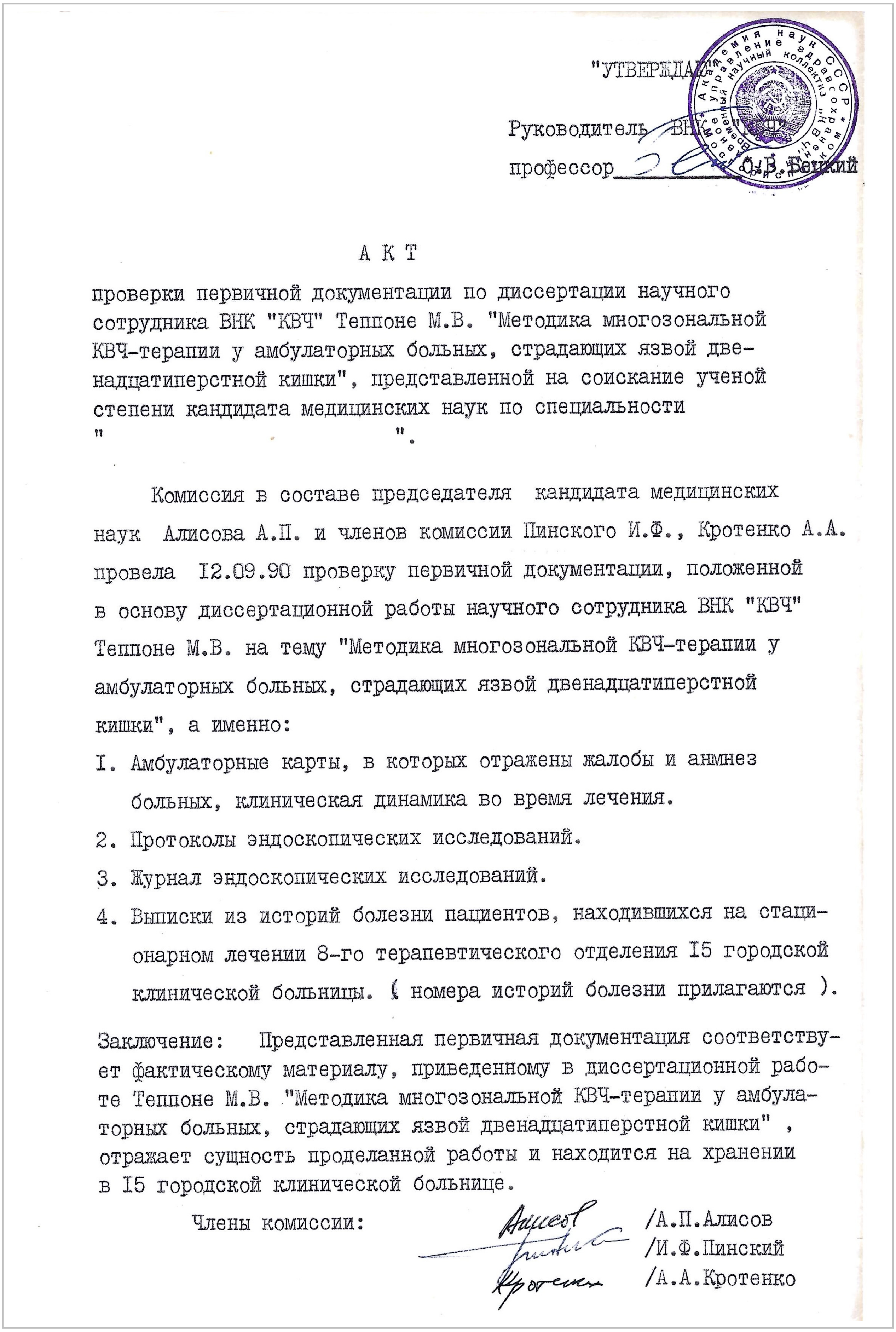
Диссертация направляется к защите впервые.

Научным руководителем утвержден доктор биологических наук А.Н.Веткин

Руководитель ВНК "КВЧ",
профессор Бецкий О.В.

Парторг Носов В.П.

Профорг Алыбина А.А.



"УТВЕРЖДАЮ"

Руководитель ВНК "КВЧ"
профессор ____________ О.В.Бецкий

А К Т

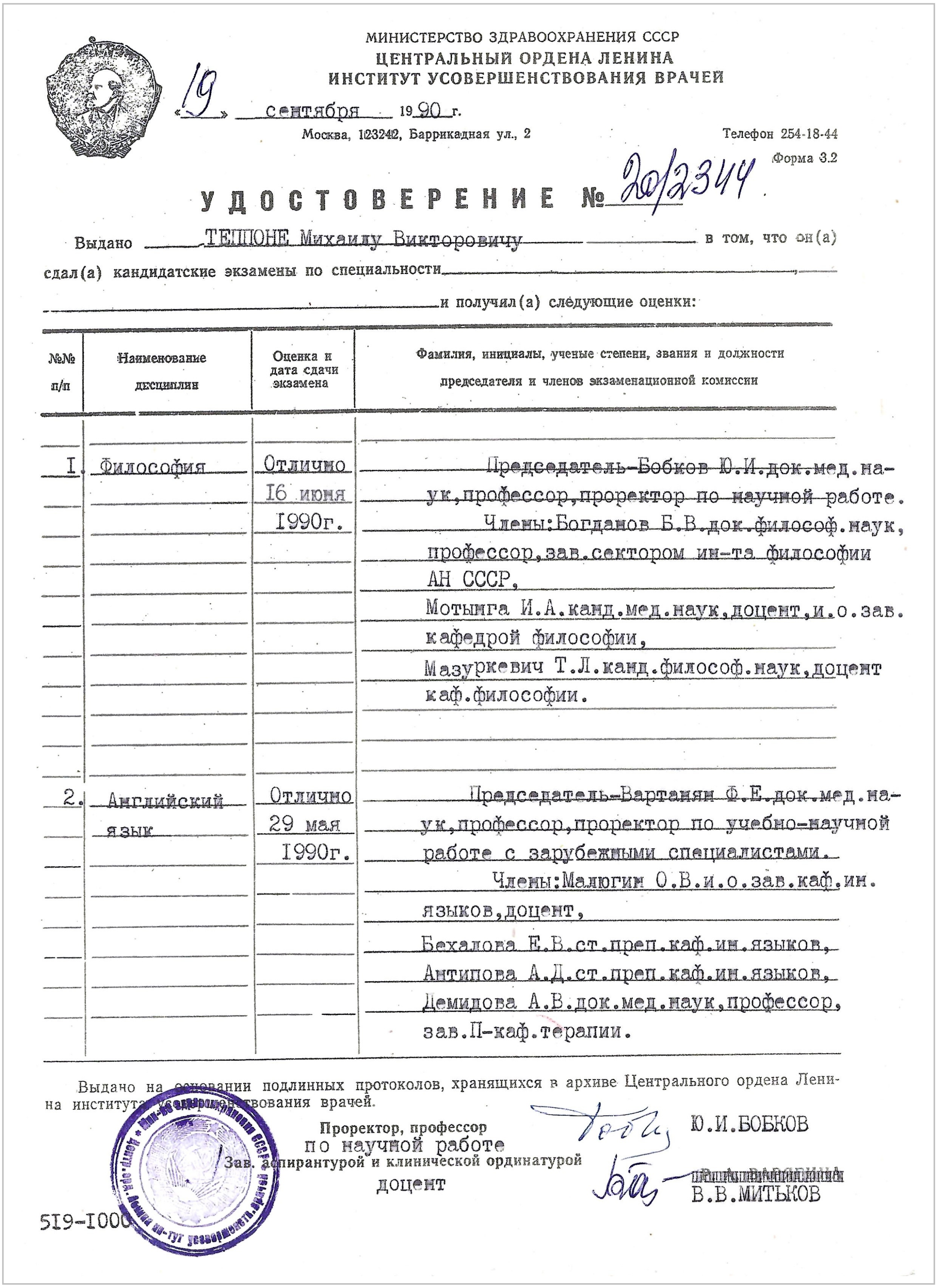
проверки первичной документации по диссертации научного сотрудника ВНК "КВЧ" Теппоне М.В. "Методика многозональной КВЧ-терапии у амбулаторных больных, страдающих язвой двенадцатиперстной кишки", представленной на соискание ученой степени кандидата медицинских наук по специальности
"   ".

Комиссия в составе председателя кандидата медицинских наук Алисова А.П. и членов комиссии Пинского И.Ф., Кротенко А.А. провела I2.09.90 проверку первичной документации, положенной в основу диссертационной работы научного сотрудника ВНК "КВЧ" Теппоне М.В. на тему "Методика многозональной КВЧ-терапии у амбулаторных больных, страдающих язвой двенадцатиперстной кишки", а именно:

I. Амбулаторные карты, в которых отражены жалобы и анмнез больных, клиническая динамика во время лечения.
2. Протоколы эндоскопических исследований.
3. Журнал эндоскопических исследований.
4. Выписки из историй болезни пациентов, находившихся на стационарном лечении 8-го терапевтического отделения I5 городской клинической больницы. (номера историй болезни прилагаются).

Заключение: Представленная первичная документация соответствует фактическому материалу, приведенному в диссертационной работе Теппоне М.В. "Методика многозональной КВЧ-терапии у амбулаторных больных, страдающих язвой двенадцатиперстной кишки", отражает сущность проделанной работы и находится на хранении в I5 городской клинической больнице.

Члены комиссии:
/А.П.Алисов
/И.Ф.Пинский
/А.А.Кротенко



МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ СССР
ЦЕНТРАЛЬНЫЙ ОРДЕНА ЛЕНИНА
ИНСТИТУТ УСОВЕРШЕНСТВОВАНИЯ ВРАЧЕЙ
«19» сентября 1990 г.
Москва, 123242, Баррикадная ул., 2
Телефон 254-18-44

Форма 3.2

УДОСТОВЕРЕНИЕ № 20/2344

Выдано ТЕППОНЕ Михаилу Викторовичу в том, что он(а) сдал(а) кандидатские экзамены по специальности __________, __________ и получил(а) следующие оценки:

№№ п/п	Наименование дисциплин	Оценка и дата сдачи экзамена	Фамилия, инициалы, ученые степени, звания и должности председателя и членов экзаменационной комиссии
I.	Философия	Отлично I6 июня I990г.	Председатель-Бобков Ю.И.док.мед.наук,профессор,проректор по научной работе. Члены:Богданов Б.В.док.философ.наук, профессор,зав.сектором ин-та философии АН СССР, Мотыига И.А.канд.мед.наук,доцент,и.о.зав. кафедрой философии, Мазуркевич Т.Л.канд.философ.наук,доцент каф.философии.
2.	Английский язык	Отлично 29 мая I990г.	Председатель-Вартанян Ф.Е.док.мед.наук,профессор,проректор по учебно-научной работе с зарубежными специалистами. Члены:Малюгин О.В.и.о.зав.каф.ин.языков,доцент, Бехалова Е.В.ст.преп.каф.ин.языков, Антипова А.Д.ст.преп.каф.ин.языков, Демидова А.В.док.мед.наук,профессор, зав.П-каф.терапии.

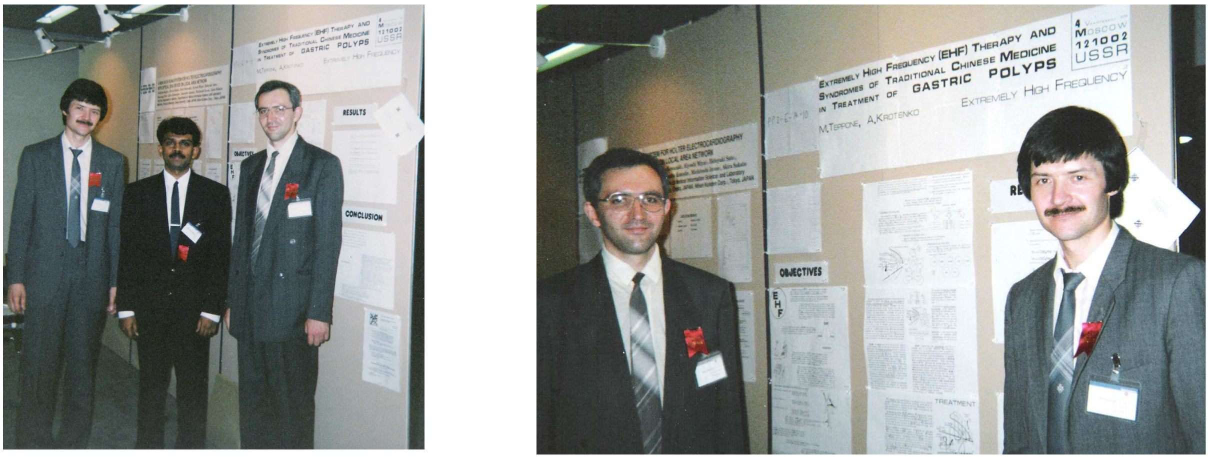
Выдано на основании подлинных протоколов, хранящихся в архиве Центрального ордена Ленина института усовершенствования врачей.

Проректор, профессор по научной работе — Ю.И.БОБКОВ

Зав. аспирантурой и клинической ординатурой доцент — В.В.МИТЬКОВ

5I9-I000

Presumably this photo was taken
after the International Symposium - Millimeter Waves of Non-Thermal Intensity in Medicine
October 3-6, 1991, Moscow, USSR
Academician N. D. Devyatkov is in the center of the photo


EXTREMELY HIGH FREQUENCY (EHF) THERAPY AND
SYNDROMES OF TRADITIONAL CHINESE MEDICINE
IN TREATMENT OF GASTRIC POLYPS
4
MOSCOW
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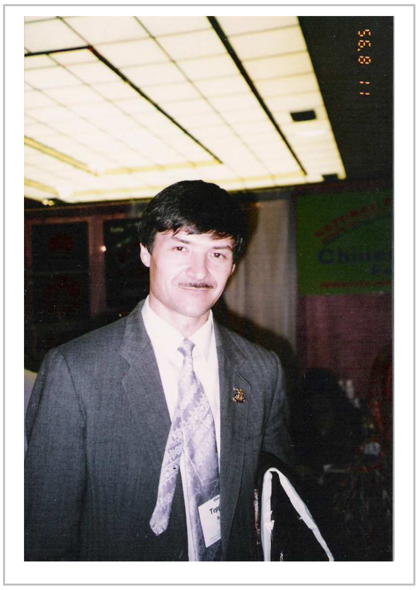
USSR
EXTREMELY HIGH FREQUENCY
M.TEPPONE, A.KROTENKO
RESULTS
CONCLUSION
OBJECTIVES
EHF
TREATMENT

World Congress on Medical Physics and Biomedical Engineering
July 7-12, 1991, Kyoto, Japan

MILLIMETER WAVES OF NON-THERMAL INTENSITY IN MEDICINE
МИЛЛИМЕТРОВЫЕ ВОЛНЫ НЕТЕПЛОВОЙ ИНТЕНСИВНОСТИ В МЕДИЦИНЕ
PROGRAM ПРОГРАММА
OCTOBER 3, THURSDAY
3 ОКТЯБРЯ ЧЕТВЕРГ
OCTOBER 4, FRIDAY
4 ОКТЯБРЯ ПЯТНИЦА
OCTOBER 5, SATURDAY
5 ОКТЯБРЯ СУББОТА
OCTOBER 6, SUNDAY
6 ОКТЯБРЯ ВОСКРЕСЕНЬЕ

Millimeter Waves of Non-Thermal Intensity in Medicine. International Symposium
October 3-6, 1991, Moscow, USSR

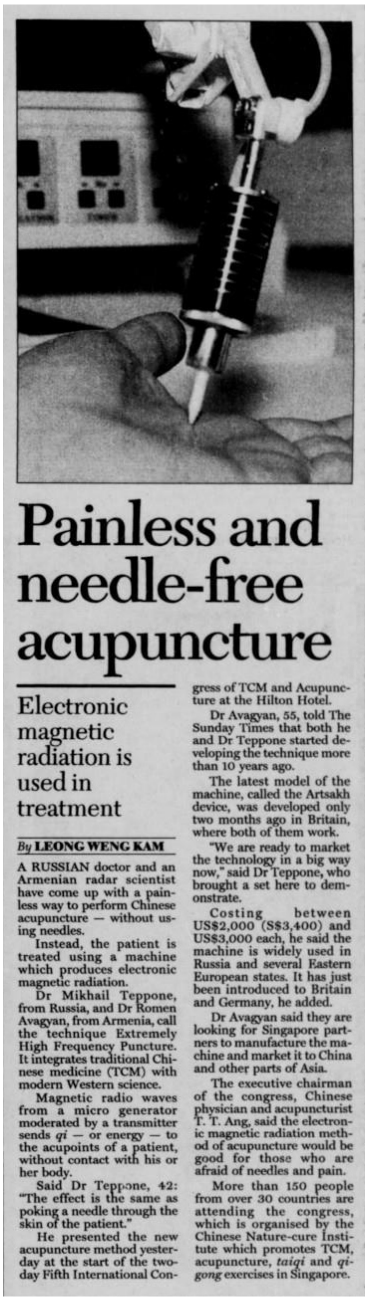
The VI Romanian International Congress of Acupuncture,
November 6-9, 1991, Bucharest, Romania



The 3rd World Congress of Medical Acupuncture and Natural Medicine, **August 8-12, 1995, Edmonton, Canada**

ICMART '99 International Medical Acupuncture Symposium
May 21-23, 1999, Riga

Practical demonstration of the equipment during at The 5th International Congress of Traditional Medicine & Acupuncture
March 18-19, 2000, Singapore



Painless and needle-free acupuncture

Electronic magnetic radiation is used in treatment

By **LEONG WENG KAM**

A RUSSIAN doctor and an Armenian radar scientist have come up with a painless way to perform Chinese acupuncture — without using needles.

Instead, the patient is treated using a machine which produces electronic magnetic radiation.

Dr Mikhail Teppone, from Russia, and Dr Romen Avagyan, from Armenia, call the technique Extremely High Frequency Puncture. It integrates traditional Chinese medicine (TCM) with modern Western science.

Magnetic radio waves from a micro generator moderated by a transmitter sends *qi* — or energy — to the acupoints of a patient, without contact with his or her body.

Said Dr Teppone, 42: "The effect is the same as poking a needle through the skin of the patient."

He presented the new acupuncture method yesterday at the start of the two-day Fifth International Congress of TCM and Acupuncture at the Hilton Hotel.

Dr Avagyan, 55, told The Sunday Times that both he and Dr Teppone started developing the technique more than 10 years ago.

The latest model of the machine, called the Artsakh device, was developed only two months ago in Britain, where both of them work.

"We are ready to market the technology in a big way now," said Dr Teppone, who brought a set here to demonstrate.

Costing between US$2,000 (S$3,400) and US$3,000 each, he said the machine is widely used in Russia and several Eastern European states. It has just been introduced to Britain and Germany, he added.

Dr Avagyan said they are looking for Singapore partners to manufacture the machine and market it to China and other parts of Asia.

The executive chairman of the congress, Chinese physician and acupuncturist T. T. Ang, said the electronic magnetic radiation method of acupuncture would be good for those who are afraid of needles and pain.

More than 150 people from over 30 countries are attending the congress, which is organised by the Chinese Nature-cure Institute which promotes TCM, acupuncture, *taiqi* and *qigong* exercises in Singapore.

Leong Weng Kam
Painless and Needle-Free Acupuncture
The Sunday Times, 2000, Mar 19, p. 36

5th International Congress of Medical & Cosmetic Acupuncture-Acupressure, Aurangabad [India] 3 to 6 Dec 2004
5th International Congress of Medical & Cosmetic Acupuncture Acupressure
Hosted By : Indian Academy of Acupuncture Science

The 5th International Congress of Medical & Cosmetic Acupuncture-Acupressure
3-6 December 2004, India, Aurangabad

Russian-Chinese Seminar on the Collaboration in the High Technology, **March 17-18, 2005, Beijing, China**